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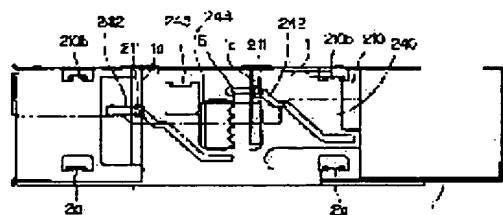
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## (54) DISK DEVICE AND DISK MAGAZINE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To miniaturize a disk device and to make the reliability of the device higher by dividing a magazine while moving trays of stages upper than a tray in which a selected disk is mounted with a driving set and setting and reproducing a disk reproducing part while transferring the part between divided magazines.

**SOLUTION:** After the locked state of a magazine housing is released, when a magazing shifting motor is started, a magazine shifting plate 240 is slidingly moved backward. Here, a holder guide pin 211 on the right side of a magazine holder 210 is energized upward with the inclined cam 242 formed on the plate 240 and the magazine holder 210 is raised to the maximum position of the full opening of the magazine. However the upper surface part of the magangine clamped with an upper side clamping pawl 210b is lifted together with three sheets of trays at the upper side of the holder 210, since the lower surface of the magazine is clamped with a lower side clamping pawl 2a, the magazine housing is divided in the inside of a chassis unit 1. Then, since a disk reproducing is performed between magazines divided into upward and downward parts, the reducing of the space of the horizontal direction is made possible.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, In the disk unit which has the disk playback section which plays the disk which was prepared on said swing unit and chosen by said disk selection section said tray It is prepared movable. the inside of said disk magazine -- a slide -- on said tray The lock location which locks a coalesce condition while while is divided and being supported at a disk magazine side according to the migration, The disk unit characterized by preparing the tray supporter material which moves between the lock discharge locations which cancel the lock of a coalesce condition while being supported at the disk magazine side of another side divided, and preparing the drive unit to which said tray is moved in said disk selection section.

[Claim 2] Said swing unit and said drive unit are a disk unit according to claim 1 characterized by driving by the common driving source.

[Claim 3] It is the disk unit according to claim 1 or 2 characterized by to establish between [ two or more ] the disk maintenance location holding the disk chosen as said tray by said disk selection section, and the disk release locations which release a disk in a movable disk attachment component in the periphery of a disk, and to prepare said disk attachment component possible [ a synchronization ] by the single link member, and for said link member to be prepared by said drive unit possible [ a drive ].

[Claim 4] It is a disk unit given in any 1 term of claims 1-3 which the loading device in which drawing in and discharge of said disk magazine are performed is prepared in said chassis unit, and said disk selection section is prepared possible [ rise and fall ] according to the tray equipped with the selected disk, and are characterized by driving said loading device and said disk selection section by the common driving source.

[Claim 5] The optical pickup to which said disk playback section detects the turntable on which a disk is laid, and the information by which it was recorded on the disk, It has the delivery device to which said optical pickup is moved. On said turntable The disk attachment component which can engage and release the main hole of a disk is prepared, and according to the energization force of said optical pickup which moves A disk unit given in any 1 term of claims 1-4 characterized by having the release device in which said disk attachment component is made to shift to a disk release condition from a disk maintenance condition.

[Claim 6] A disk unit given in any 1 term of claims 1-5 characterized by preparing the standby condition lock section which regulates the variation rate of said swing unit before being transferred between disk magazines in said disk selection section.

[Claim 7] A disk unit given in any 1 term of claims 1-6 characterized by preparing the transfer condition lock section which regulates the variation rate of said swing unit transferred between disk magazines in

said chassis unit.

[Claim 8] A disk unit given in any 1 term of claims 1-7 which a vertical guide hole is formed at least in one side of said disk magazine divided, and are characterized by preparing the guide shaft of the perpendicularly it inserts in said guide hole at the time of division of said disk magazine and coalesce at said chassis unit.

[Claim 9] It is a disk unit given in any 1 term of claims 1-8 to which the tray guide which goes up and down with the divided disk magazine is prepared in said disk division section, and it is characterized by said tray guide having the slit in which the edge of the tray in the disk magazine which goes up and down is inserted possible [ sliding by the migration ].

[Claim 10] The tray equipped with a disk of two or more sheets is contained, and it sets to the disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section. Said tray It is prepared movable. the inside of said disk magazine -- a slide -- on said tray The lock location which locks a coalesce condition while while is divided and being supported at a disk magazine side according to the migration, The disk magazine characterized by preparing the tray supporter material which moves between the lock discharge locations which cancel the lock of a coalesce condition while being supported at the disk magazine side of another side divided.

[Claim 11] The disk magazine according to claim 10 characterized by preparing trace pulling which energizes said tray in the direction which regulates migration of said tray at either [ at least ] the top-face section of said disk magazine, or the inferior-surface-of-tongue section.

[Claim 12] The disk magazine according to claim 10 or 11 characterized by forming the vertical guide hole in either [ at least ] the top-face section of said disk magazine, or the inferior-surface-of-tongue section.

[Claim 13] It is a disk magazine given in any 1 term of claims 10-12 characterized by for between [ two or more ] the disk maintenance location holding a disk and the disk release locations which release a disk being established in a movable disk attachment component by said tray in the periphery of a disk, and preparing said disk attachment component in it possible [ a synchronization ] by the single link member.

[Claim 14] A disk magazine given in any 1 term of claims 10-13 to which the disk locking lever which makes said disk attachment component shift to a disk release location is characterized by being prepared movable by hand control.

[Claim 15] A disk magazine given in any 1 term of claims 10-14 characterized by establishing between the regulation location which regulates slide migration of said tray at the migration edge of said disk locking lever, and the release locations which release said tray in the movable tray lock link.

[Claim 16] A disk magazine given in any 1 term of claims 1-15 characterized by vacating spacing for the periphery of said top-face section and said inferior-surface-of-tongue section, and forming the side attachment wall in it in the condition that said top-face section and said inferior-surface-of-tongue section coalesced so that opening may be formed in the side face.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] By choosing a desired disk, starting playback and the disk unit to record out of the disk magazine which held two or more disks, and performing disk selection, playback, and record, where a disk magazine is divided especially up and down, this invention enables contiguity arrangement of each configuration member, and relates to the disk magazine used for the disk unit and this aiming at the miniaturization of the whole equipment.

[0002]

[Description of the Prior Art] In recent years, the spread of the disk units using a disk as a medium is remarkable like a CD player or MD player. Especially, as a disk unit for mount, the thing of the autochanger type which chooses a desired disk and is reproduced out of the disk magazine which contained two or more disks is developed. Since the disk unit of this autochanger type does not need to take one disk at a time in and out whenever it exchanges the disk to play, it is convenient especially as an object for mount.

[0003] The disk unit using such a disk magazine adjoins the magazine hold section, and the disk playback section is arranged. And after pulling out the disk of the request in a magazine and conveying and setting to the disk playback section according to a conveyance device, there was much what performs disk playback. However, if it is made this configuration, in order to secure the tooth space which sets a disk to the disk playback section and is reproduced, it is necessary to keep a fixed distance between the disk playback sections and the magazine hold sections which were prepared adjacently. Therefore, as a device for mount by which the whole disk unit will large-sized-size, and the installation tooth space was restrained, it was disadvantageous.

[0004] For example, if it sees for the latest audio equipment for mount, the opening dimension by the side of the car which contains it will have been unified into 180x50 (mm) called DIN size or 180x100 (mm) called double DIN size. Moreover, that which gets mixed up 160mm and suits also about the depth dimension of opening is the present condition, and receives constraint of the audio equipment anchoring tooth space of a car.

[0005] On the other hand, since considering that the size of a compact disk is the diameter of 120mm the dimension more than 2= 120x240 (mm) is needed in the longest direction of breadth by the above disk units, it turns out that a device cannot be contained at opening located beside a driver's seat.

[0006] He is trying to contain the inside of the trunk of a car, and near the step of a driver's seat in the conventional CD autochanger from the above situations. However, in the case of the former, there is a fault, like the long line which will not become if open a trunk whenever it is the exchange of a disk to which a trunk tooth space becomes narrow, and it kicks and which connects a trunk and a control unit is needed. Moreover, in the case of the latter, a space part underfoot becomes so narrow, and when a guide peg touches accidentally, it may damage.

[0007] In order to cope with this, a disk magazine is divided up and down and the disk unit which performs disk playback where the disk playback section is transferred between them is proposed as

proposed by JP,6-203519,A. Since a disk stowed position and a disk playback location lap, such a disk unit can reduce a horizontal tooth space.

[0008] In addition, usually performs division of a disk magazine with the magazine electrode holder prepared in the chassis unit possible [ rise and fall ]. That is, the configuration of raising a magazine electrode holder with the pin which moves in the inside of a stair-like cam is taken by inserting the pin fixed to the magazine electrode holder in the stair-like cam formed in the cam plate, and carrying out slide migration of this cam plate in order. And by holding a upside disk magazine and raising this magazine electrode holder with a magazine electrode holder, a upside disk magazine is lifted with an internal tray, and it divides from a lower disk magazine.

[0009]

[Problem(s) to be Solved by the Invention] However, there were the following points which should be improved in the disk unit using the disk magazine of the above block construction. That is, when the device which carries out loading of the disk magazine, the device which chooses the disk to play, the device in which the coalesce condition of a disk magazine is canceled, and a disk magazine are divided, the device in which a tray is held, the device which releases the selected disk from a tray and is set on a turntable are complicated respectively, and there are many driving sources to need. For this reason, many complicated devices needed to be prepared in the perimeter of a disk magazine, and complication of the whole equipment and enlargement were caused.

[0010] Moreover, since there are no tooth-space-allowances in the upper and lower sides of the disk playback section transferred between the divided disk magazines, it is difficult for them from the disk on a turntable to carry out chucking by the usual clasper. Therefore, even if it is a narrow tooth space, development of the simple device in which wearing of a disk and desorption to a turntable can be performed certainly is expected.

[0011] Moreover, the disk playback section of a transfer mold is usually prepared on the swing unit which rotates centering on a revolving shaft. For this reason, when a swing unit is transferred between the divided up-and-down disk magazines, the disk playback section will be supported only by one point of the rotation supporting point of a swing unit, and when it is weak and uses as a disk unit for mount to vibration, it becomes disadvantageous.

[0012] Moreover, at the time of usual [ at the time of carrying and disk insertion etc. ], the disk magazine of an assembled die locks the integrated state, and only at the time of disk playback, a lock needs to be canceled and it needs to be divided. For this reason, it is necessary to have a member only for locks, and the structure of a disk magazine is complicated.

[0013] Moreover, if a gap arises in the location of an up-and-down disk magazine in case the divided disk magazine is made to coalesce again, a malfunction will be produced, without the ability coalescing. If a firm maintenance device tends to be used or it is going to raise location precision in order to cope with this, a complicated mechanism and expensive components will be needed and it will become disadvantageous for a miniaturization and low-cost-izing.

[0014] It is proposed in order to solve the trouble of the above conventional techniques, and the main purpose can realize the lock of a disk magazine and lock discharge, selection of a disk, tray maintenance, disk maintenance, disk release, etc. by the easy device and few driving sources, and this invention is small, and is offering a reliable disk unit.

[0015] The 2nd purpose of this invention is simple structure, and is offering the disk unit which can prevent the location gap at the time of carrying out division coalesce of the disk magazine.

[0016] Even if the 3rd purpose of this invention is a narrow tooth space, it is offering the disk unit equipped with the simple device wearing of a disk and desorption to a turntable being performed certainly.

[0017] The 4th purpose of this invention is offering an advantageous disk unit, when it is strong and uses as a disk unit for mount to vibration.

[0018] The 5th purpose of this invention is a simple internal structure, and is offering the disk magazine which can perform the lock and lock discharge of an integrated state.

[0019]

[Means for Solving the Problem] In order to solve the above troubles, the disk unit of this invention The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, It is prepared on said swing unit and has the following technical features in the disk unit which has the disk playback section which plays the disk chosen by said disk selection section.

[0020] Invention according to claim 1 namely, said tray It is prepared movable. the inside of said disk magazine -- a slide -- on said tray The lock location which locks a coalesce condition while while is divided and being supported at a disk magazine side according to the migration, It is characterized by preparing the tray supporter material which moves between the lock discharge locations which cancel the lock of a coalesce condition, while being supported at the disk magazine side of another side divided, and preparing the drive unit to which said tray is moved in said disk selection section.

[0021] In the above invention according to claim 1, the tray of the stage more than the tray which equipped with the selected disk by the drive unit is moved. Then, a lock condition is canceled while the tray which moved is supported by tray supporter material at the one side of a disk magazine. And the tray of the stage more than the tray which could come, simultaneously was chosen by the magazine division section when the top-face section of a disk magazine was raised goes up.

[0022] The selected disk is set to the disk playback section by transferring the disk playback section between the divided disk magazines, and dropping the magazine division section in this condition. And after raising one side of a disk magazine and securing up-and-down path clearance, set disk playback is performed in the disk playback section.

[0023] By the magazine division section, after playback termination descends one disk magazine, makes a tray approach the disk on the disk playback section, and holds a disk. Then, the magazine division section is raised and a disk is removed from the disk playback section. Next, shake out the disk playback section, drop the magazine division section, and a disk magazine is made to coalesce again, by the drive unit, a tray is moved and a magazine is made into a lock condition.

[0024] Invention according to claim 2 is characterized by driving said swing unit and said drive unit by the common driving source in a disk unit according to claim 1.

[0025] In the above invention according to claim 2, since a swing unit and a drive unit drive by the common driving source, it becomes saving of the number of members.

[0026] Invention according to claim 3 is set to a disk unit according to claim 1 or 2. On said tray The disk maintenance location holding the disk chosen by said disk selection section, Between [ two or more ] the disk release locations which release a disk are established in a movable disk attachment component in the periphery of a disk. Said disk attachment component It is characterized by being prepared possible [ a synchronization ] and said link member being prepared by said drive unit possible [ a drive ] by the single link member.

[0027] In the above invention according to claim 3, since a drive unit and a single link member perform the maintenance and release of a disk from a tray, a common device can perform lock of a disk magazine and lock discharge, and maintenance and release of a disk, and the simplification of equipment and saving of a tooth space are attained.

[0028] The loading device in which invention according to claim 4 performs drawing in and discharge of said disk magazine to said chassis unit in a disk unit given in any 1 term of claims 1-3 is established, said disk selection section is prepared possible [ rise and fall ] according to the tray equipped with the selected disk, and said loading device and said disk selection section are characterized by driving by the common driving source.

[0029] In the above invention according to claim 4, since a loading device and the disk selection section drive by the common driving source, it becomes saving of the number of members.

[0030] Invention according to claim 5 is set to a disk unit given in any 1 term of claims 1-4. Said disk playback section The turntable on which a disk is laid, and the optical pickup which detects the

information recorded on the disk, It has the delivery device to which said optical pickup is moved. On said turntable The disk attachment component which can engage and release the main hole of a disk is prepared, and is characterized by having the release device in which said disk attachment component is made to shift to a disk release condition from a disk maintenance condition according to the energization force of said optical pickup which moves.

[0031] In the above invention according to claim 5, while a disk attachment component can perform wearing of the disk to a turntable top without a clamper, since the release device in which a disk is released is driven by migration of optical pickup, it can omit a special driving source and the miniaturization of the whole equipment of it is attained.

[0032] In invention according to claim 6, it is characterized by preparing the standby condition lock section which regulates the variation rate of said swing unit before any 1 term of claims 1-5 is transferred by said disk selection section between disk magazines in the disk unit of a publication.

[0033] In the above invention according to claim 6, since the swing unit in a standby condition is stabilized and is held by the standby condition lock section, the shake by vibration is prevented and deformation of components and fear of breakage disappear.

[0034] Invention according to claim 7 is characterized by preparing the transfer condition lock section which regulates the variation rate of said swing unit transferred to any 1 term of claims 1-6 by said chassis unit between disk magazines in the disk unit of a publication.

[0035] In the above invention according to claim 7, since the transferred swing unit is stabilized and is held by the transfer condition lock section, while skipping by vibration stops occurring at the time of disk playback, deformation of components and fear of breakage disappear.

[0036] A vertical guide hole is formed at least in one side of said disk magazine divided in a disk unit given in any 1 term of claims 1-7, and invention according to claim 8 is characterized by preparing the guide shaft of the perpendicularly it inserts in said guide hole at the time of division of said disk magazine and coalesce in said chassis unit.

[0037] In the above invention according to claim 8, in case the magazine division section divides a disk magazine, the top-face section or the inferior-surface-of-tongue section of a disk magazine moves perpendicularly. A guide shaft inserts in the guide hole formed in the magazine which moves at this time. And in case a disk magazine is coalesced, since migration of a magazine is guided by the guide shaft inserted in the guide hole, a location gap is prevented and a malfunction does not arise by it.

[0038] The tray guide which invention according to claim 9 goes up and down with the divided disk magazine in said disk division section in a disk unit given in any 1 term of claims 1-8 is prepared, and it is characterized by said tray guide having the slit in which the edge of the tray in the disk magazine which goes up and down is inserted by the migration possible [ sliding ].

[0039] In the above invention according to claim 9, since the edge of a tray to go up and down is supported by the slit of a tray guide, a tray's hanging down is prevented.

[0040] Moreover, the tray equipped with a disk of two or more sheets is contained, and the disk magazine of this invention has the following technical features in the disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section.

[0041] namely, invention according to claim 10 -- said tray -- the inside of said disk magazine -- a slide - it carries out that it is prepared movable and the tray supporter material which moves between the lock location which locks a coalesce condition while while is divided and being supported at a disk magazine side according to the migration, and the lock discharge locations which cancel the lock of a coalesce condition while being supported at the disk magazine side of another side divided to said tray is prepared as the description.

[0042] In the above invention according to claim 10, since a lock and lock discharge of a disk magazine are realizable with slide migration of a tray, the structure in a magazine can be simplified.

[0043] Invention according to claim 11 is characterized by preparing trace pulling which energizes said tray in the direction which regulates migration of said tray in a disk magazine according to claim 10 at either [ at least ] the top-face section of said disk magazine, or the inferior-surface-of-tongue section.

[0044] In the above invention according to claim 11, since slide migration of a tray is controlled by the



energization force of trace pulling, the elutriation of the tray by vibration is prevented according to it.  
[0045] Invention according to claim 12 is characterized by forming the vertical guide hole in a disk magazine according to claim 10 or 11 at either [ at least ] the top-face section of said disk magazine, or the inferior-surface-of-tongue section.

[0046] In the above invention according to claim 12, since migration of the magazine top-face section or the magazine inferior-surface-of-tongue section is guided by making a shaft etc. insert in a guide hole, division of a disk magazine and the location gap at the time of coalesce are prevented.

[0047] In a disk magazine given in any 1 term of claims 10-12, between [ two or more ] the disk maintenance location holding a disk and the disk release locations which release a disk are established in a movable disk attachment component by said tray in the periphery of a disk, and invention according to claim 13 is characterized by preparing said disk attachment component possible [ a synchronization ] by the single link member at it.

[0048] In the above invention according to claim 13, since it is realizable by driving a link member with single maintenance and release of a disk to the perimeter of a tray, the device for releasing the disk with which it was equipped on the turntable from a tray can be simplified.

[0049] Invention according to claim 14 is characterized by preparing the disk locking lever which makes said disk attachment component shift to any 1 term of claims 10-13 to a disk release location in the disk magazine of a publication movable by hand control.

[0050] In the above invention according to claim 14, since a disk attachment component can be evacuated from the perimeter of a disk by moving a disk locking lever manually, reservation of the disk maintenance to a disk magazine, insertion of a disk, and easy-ization of discharge can be reconciled.

[0051] Invention according to claim 15 is characterized by establishing between the regulation location which regulates slide migration of said tray at the migration edge of said disk locking lever, and the release locations which release said tray in the movable tray lock link in a disk magazine given in any 1 term of claims 10-14.

[0052] In the above invention according to claim 15, a tray lock link prevents the blank of a disk locking lever by being prepared in the migration edge of a disk locking lever while preventing the elutriation of a tray.

[0053] In the condition that said top-face section and said inferior-surface-of-tongue section coalesced in any 1 term of claims 1-15 in the disk magazine of a publication, invention according to claim 16 is characterized by vacating spacing for the periphery of said top-face section and said inferior-surface-of-tongue section, and forming the side attachment wall in it so that opening may be formed in the side face.

[0054] A small disk magazine can consist of above invention according to claim 16 by omitting a part of side attachment wall, and preparing opening.

[0055]

[Embodiment of the Invention] The gestalt of operation of this invention is explained below with reference to drawing 1 - drawing 42 .

[0056] [1. Configuration] of the gestalt of operation

1-1. The disk unit of the gestalt of whole configuration book operation is constituted by preparing two or more following units on the chassis unit 1 equipped with the case 100 of a disk magazine, as shown in drawing 1 .

[0057] \*\* Divide the magazine case 100 up and down, and it is prepared on the up-and-down unit 300\*\* up-and-down unit 300 which chooses the disk D of the magazine shift unit 200\*\* purpose which secures a playback tooth space in the meantime. It is prepared on the swing unit 400\*\* swing unit 400 transferred to the playback tooth space of the divided magazine case 100. These configurations are explained in full detail below the magazine ejection unit 600 (refer to drawing 17 ) that discharges the drive unit 500\*\* magazine case 100 equipped with optical pickup.

[0058] 1-2. \*\*\*\* of a disk magazine -- explain the configuration of a disk magazine with reference to drawing 2 - drawing 7 first. In addition, let back and the lower part in drawing be the front for the upper part in drawing 3 - drawing 5 . That is, as shown in drawing 2 , it is divided on the tray 110 of five

sheets which the interior holds Disk D according to an individual, and holds the magazine case 100 of a thin form. This magazine case 100 is formed in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 possible [ division ]. The configuration of each part is as follows. [0059] \*\* As each tray 110 which divides the inside of the tray magazine case 100 is shown in drawing 3, it is the plate of an abbreviation square configuration and the radii-like radius of circle is formed in the angle corresponding to insertion opening (the drawing Nakaya mark shows) of Disk D. Near the back end of the right-hand side edge of this tray 110, the 1st tray support pawl 111 projected to the method of the right is formed. And near the front end of the right-hand side edge of a tray 110, the 2nd tray support pawl 112 projected to the method of the right is formed. Stop projection 112a is formed 2nd front and behind the tray support pawl 112. Furthermore, near the front end of the left-hand side edge of a tray 110, the 3rd tray support pawl 113 projected to the left is formed.

[0060] The 1st disk catch 114 and the 2nd disk catch 115 are formed in the corner corresponding to the 1st tray support pawl 111 in a tray 110. Disk attaching part 114a is prepared and, as for the 1st disk catch 114, is attached in the back end rotatable [ the center section ] on a tray 110. Pressed pawl 114b is formed in this 1st disk catch's 114 posterior part. The 1st disk catch's 114 front end is connected with the back end rotatable, the 2nd disk catch 115 is attached rotatable [ the center section ] on a tray 110, and disk attaching part 115a is prepared in the front end.

[0061] Furthermore, the 3rd disk catch 116 is formed near the corner corresponding to the 3rd tray support pawl 113 in a tray 110. Disk attaching part 116a is prepared and, as for this 3rd disk catch 116, is attached in that back end rotatable [ that front end ] on a tray 110.

[0062] These 1-3rd disk catches 114-116 are formed by the disk catch link 117 possible [ linkage ]. This disk catch link 117 is the plate of L typeface, and is attached rotatable centering on the corner of that L typeface near the corner corresponding to the 2nd tray support pawl 112 in a tray 110. It connects with the 1st and 2nd disk catches' 114,115 joining segment near the back end of the disk catch link 117 rotatable. Moreover, at a projection and its tip, as for the back end of the disk catch link 117, character section 117a of KO of the typeface of KO is formed in right-hand side for the cross section.

Furthermore, the front end of the disk catch link 117 is back energized with the catch spring 118 which is torsion coiled spring while it is connected rotatable near the 3rd disk catch's 116 back end.

[0063] since such a disk catch link 117 is energized with the catch spring 118 -- the 1- the 3rd disk catch 114-116 is energized in the direction in which the disk attaching parts 114a-116a press the edge of Disk D. In addition, rotation of the disk catch link 114 is regulated by regulation slot 117b formed in the tray 110 at the constant rate.

[0064] Moreover, slitting 110a is formed in the both ends of the circular section in a tray 110, and 110d of lobes of the shape of a small right triangle is formed in the trailing edge of the circular section. And radii-like notch 110b is formed near the corner corresponding to the 2nd tray support pawl 112 in a tray 110. Furthermore, near [ three ] corners other than the disk insertion opening side in a tray 110, disk guide 110c which contacts the periphery of Disk D is formed.

[0065] \*\* Explain the configuration of the magazine top-face section magazine top-face section 120 with reference to drawing 4. namely, the magazine top-face section 120 -- the top-face plate 121 and the 1- it is constituted by the 3rd top slit section 122-124. The top-face plate 121 is the plate of an abbreviation square configuration, and the radii-like radius of circle is formed in the angle corresponding to insertion opening (the drawing Nakaya mark shows) of Disk D. Besides, slitting 121a is formed in the both ends of the circular section in a face-plate 121.

[0066] the 1- the 3rd top slit section 122-124 -- the 1- of a tray 110 -- it is formed corresponding to the 3rd tray support pawl 111-113. these the 1- it is shown in drawing 6 (A) at the 3rd top slit section 122-124 -- as -- the 1- of each tray 110 -- the slits 122a-124a in which the 3rd tray support pawl 111-113 is inserted, respectively are formed. The number of Slits 122a-124a is the number of sheets and the same number (the gestalt of this operation five) of a tray 110. The maximum upper case is formed for a long time among these slits 122a-124a compared with other stages.

[0067] moreover, the 1- in the top-face plate 121 -- near the 3rd top slit section 122-124, heights 121b projected caudad, respectively is formed. Moreover, behind the 2nd top slit section 123, the bottom trace

pulling 125 which stop projection 112a of the right-hand side edge of a tray 110 contacts is formed. And the guide hole 126 which is a small round hole perpendicularly penetrated to the anterior part of the top-face plate 121 is formed in two right and left. Furthermore, the side attachment wall 127 is formed in the right-hand side edge in the top-face plate 121.

[0068] \*\* As shown in drawing 5, the magazine inferior-surface-of-tongue section magazine inferior-surface-of-tongue section 130 is the same configuration as the top-face plate 121, and is constituted by the inferior-surface-of-tongue plate 131 which has slitting 131a. the inferior-surface-of-tongue plate 131 -- the 1- by the side of the magazine top-face section 120 -- the 1- which holds a tray 110 at the magazine inferior-surface-of-tongue section 130 side, respectively in the location corresponding to the 3rd top slit section 122-124 -- the 3rd bottom slit section 132-134 is formed. this the 1- it is shown [ 132 ] in drawing 6 (A) at the 3rd bottom slit section-134 -- as -- the 1- of each tray 110 -- same number formation of the slits 132a-134a in which the 3rd tray support pawl 111-113 is inserted is carried out with the number of sheets of a tray 110.

[0069] such the 1- the time of there being five slits 132a-134a of the 3rd bottom slit section 132-134 in the condition that the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 coalesced -- the 1- five steps of slits which continued horizontally with the slits 122a-124a of the 3rd top slit section 122-124 are constituted.

[0070] And crevice 131b three heights 121b of the top-face plate 121 carries out [ b ] fit, respectively is formed in the inferior-surface-of-tongue plate 131. Furthermore, rectangle-like hollow 131c is formed before back slitting 131a in the outsole side of the inferior-surface-of-tongue plate 131, and 131d of locked slots of L typeface is formed in the right of this slitting 131a.

[0071] Moreover, the disk discharge lever 135 is formed near the 2nd bottom slit section 133 in the inferior-surface-of-tongue plate 131. This disk discharge lever 135 is formed in the location corresponding to notch 110b in a tray 110 rotatable, and is energized in the direction contrary to the direction where that tip discharges Disk D by torsion coiled spring 135a. Furthermore, the bottom trace pulling 139 which contacts stop projection 112a of a tray 110 ahead of the 2nd bottom slit section 133 is formed.

[0072] And as shown in drawing 5 and drawing 7, near the 1st bottom slit section 132 of the inferior-surface-of-tongue plate 131, the disk locking lever 136 and the tray lock link 137 are formed. The disk locking lever 136 is constituted by plate section 136a, press section 136b, and control unit 136c. the pin which 136d of slide holes of L typeface was formed in plate section 136a, and was fixed to the inferior-surface-of-tongue plate 131 side is inserted in 136d of this slide hole -- the disk locking lever 136 -- the shape of L character -- a slide -- it is prepared movable.

[0073] Control unit 136c started perpendicularly is prepared in the back end of plate section 136a. the rear face of this control unit 136c -- many -- the slot of several articles was formed and it has exposed from the posterior part of a magazine. And at the right end of control unit 136c, press section 136b projected ahead is prepared. The tip of press section 136b is established in the 1st disk catch's 114 pressed pawl 114b possible [ attachment and detachment ]. And since it is energized leftward in drawing, in the condition that external force does not join control unit 136c, press section 136b contacts pressed pawl 114b, and, as for plate section 136a, rotation of the 1st disk catch 114 and the 2nd disk catch 115 is locked by torsion coiled spring 136e.

[0074] The tray lock link 137 is the plate prepared in the inferior-surface-of-tongue plate 131 rotatable, and the edge is established in the right rear edge of a tray 110 by the rotation possible [ engaging and releasing ] (refer to drawing 39 ). And this tray lock link 137 is energized rightward in drawing by torsion coiled spring 137a. Moreover, the tray lock link 137 has been arranged at the movable range edge of the disk locking lever 136, and has regulated migration to the right of the disk locking lever 136 in the fixed range. And the discharge pawl guide 138 to which the tray lock discharge pawl 4 (refer to drawing 39 ) formed in the chassis unit 1 side is inserted in the inferior-surface-of-tongue plate 131 is formed. Furthermore, side-attachment-wall 130a is prepared in right and left of the first transition in the inferior-surface-of-tongue plate 130, and the front end of a right-hand side edge.

[0075] 1-3. a magazine shift unit -- raise the magazine top-face section 120 of the above configurations,

and explain the configuration of the magazine shift unit 200 which divides the magazine case 100 according to drawing 8 - drawing 16 . In addition, let the upper part of drawing 8 into back, and let a lower part be the front. This magazine shift unit 200 is constituted by the magazine electrode holder 210, the cylindrical cam 220, the synchro gear 230, and the magazine shift plate 240 grade. The configuration of each part is as follows.

[0076] \*\* It is the member crooked in cross-section horseshoe-shaped in the plate, and the top face is formed in the almost same configuration as the magazine top-face section 121 so that the magazine electrode-holder magazine electrode holder 210 may cover the top-face plate 121 and both its side of the magazine top-face section 120, as shown in drawing 8 -10. this magazine electrode holder 210 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable.

[0077] The frame-like magazine insertion opening 2 is formed in the anterior part of the chassis unit 1 so that the front end of the magazine electrode holder 210 may be surrounded. One guide shaft 3 projected perpendicularly is being caudad fixed to the head-lining side of this magazine insertion opening 2 at a time by right and left. And when the magazine electrode holder 210 moves up and down, two insertion hole 210a which the two above-mentioned guide shafts 3 insert in by non-contact, respectively is formed in the top face of the magazine electrode holder 210. In addition, the guide shaft 3 and insertion hole 210a are prepared in the location corresponding to the guide hole 126 of the magazine top-face section 120 with which it was completely equipped in the magazine electrode holder 210. Moreover, inside the side face of right and left of the magazine electrode holder 210, bottom grasping pawl 210b which grasps the inserted top-face plate 121 of the magazine top-face section 120 is prepared.

[0078] On the other hand, bottom grasping pawl 2a which grasps the inserted inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 is prepared in the medial surface of right and left of the magazine insertion opening 2 in the chassis unit 1. In addition, return section 210c opened outside and 2b are formed in the front end of the magazine electrode holder 210 with which the magazine case 100 is inserted, and the front end of the base of the magazine insertion opening 2.

[0079] And as shown in drawing 11 and drawing 12 , two electrode-holder guide pins 211 are formed in the right lateral of the magazine electrode holder 210. right-hand side electrode-holder guide slot 1a by which two trains of these two electrode-holder guide pins 211 were formed perpendicularly at the right lateral of the chassis unit 1 -- a slide -- it is inserted in movable.

[0080] On the other hand, as shown in drawing 13 and drawing 14 , one electrode-holder guide pin 211 is formed in the left lateral of the magazine electrode holder 210. left-hand side electrode-holder guide slot 2c by which one train of this one electrode-holder guide pin 211 was formed perpendicularly at the magazine insertion opening 2 -- a slide -- it is inserted in movable.

[0081] Moreover, the cloth plate 213 of two sheets by which crossover arrangement was carried out is formed in the shape of an X character at the left lateral of the magazine electrode holder 210. That core is connected rotatable mutually and, as for this cloth plate 213, each upper limit is attached in the left lateral upper part of the magazine insertion opening 2 rotatable. Moreover, each lower limit of a cloth plate 213 is attached in the left lateral of the magazine electrode holder 210 rotatable. the edge behind [ each ] the cloth plate 213 of these two sheets -- the left lateral of the magazine insertion opening 2 and the magazine electrode holder 210 -- a constant-rate slide -- it is prepared movable. For this reason, the cloth plate 213 has composition expanded and contracted in the height direction according to vertical movement of the magazine electrode holder 210, as shown in drawing 14 .

[0082] Furthermore, as shown in drawing 13 and drawing 14 , the tray guide 212 is formed in the posterior part of the magazine electrode holder 210. This tray guide 212 is the member of the perpendicularly slit 212a of the shape of a ctenidium corresponding to the number of trays 110 was formed. It has the composition that 110d of lobes of each tray 110 which moved goes into each slit 212a.

[0083] \*\* The cylindrical-cam cylindrical cam 220 is formed in the left side of the magazine insertion opening 2 in the chassis unit 1 rotatable centering on the vertical shaft, as shown in drawing 8 - drawing 10 . Spiral cam 220a is formed in the perimeter of a cylindrical cam 220, and the electrode-holder guide pin 211 of the magazine electrode holder 210 is engaging with this spiral cam 220a. Moreover, Ohira

gearing 220b is formed in the perimeter of the lower part of a cylindrical cam 220. This Ohira gearing 220b is engaging with transfer gear 221a which tells the driving force of the magazine shift motor 221 attached in the chassis unit 1. Furthermore, disc-like gear 220c which is the Kodaira gearing is formed in the lowest edge of a cylindrical cam 220.

[0084] \*\* The synchro gear synchro gear 230 is constituted by the 1st disk section 231 and the 2nd disk section 232 which were prepared in the outsole side of the chassis unit 1 as shown in drawing 8. The 1st disk section 231 and the 2nd disk section 232 adjoin right and left, and are arranged, and the core is established in them rotatable as a shaft, respectively. While circular gear 231a which engages with disc-like gear 220c of a cylindrical cam 220 is formed in the 1st disk section 231, circular gear 231b is formed in the location which counters this circular gear 231a.

[0085] While circular gear 232a which engages with circular gear 231b of the 1st disk section 231 is formed in the 2nd disk section 232, circular gear 232b is formed in the location which counters this circular gear 232a. In addition, the amount of rotation is regulated so that engagement of the circular gears 231b and 232a may not separate from the 1st disk section 231 and the 2nd disk section 232.

[0086] \*\* it is shown in the right lateral of the magazine SHIFUTOPURETO chassis unit 1 at drawing 8, drawing 15, and drawing 16 -- as -- the magazine shift plate 240 -- order -- a slide -- it is prepared movable. That horizontal plane is established along the base of the chassis unit 1, and, as for this magazine shift plate 240, the rack 241 for a magazine shift is formed in the left-hand side edge of this horizontal plane. And the rack 241 for a magazine shift is engaging with circular gear 232b in the 2nd disk section 232.

[0087] Moreover, the right-hand side of the magazine shift plate 240 serves as a vertical plane started in accordance with the right lateral of the chassis unit 1. As shown in drawing 16, two inclination cam dies 242 which inclined from the front so that it might become low according to back are mutually formed in this vertical plane in parallel. and -- this inclination cam die 242 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable. Furthermore, the right floating lock pawl 243 projected at a level with the method of the right is formed in the vertical plane of the magazine shift plate 240.

[0088] 1-4. In order to choose the disk D which carries out up-and-down unit playback, explain the configuration of the up-and-down unit 300 which determines the division location of the magazine case 100 according to drawing 17 - drawing 30. In addition, let the upper part of drawing 17 into back, and let a lower part be the front. This up-and-down unit 300 is constituted by the loading gear 310, the post-shift plate 320, the link plate 330, the left shift plate 340, the up-and-down chassis 350, and the drive unit 360 grade. The configuration of each part is as follows.

[0089] \*\* The loading gear loading gear 310 is formed in the method of the left rear of the base of the chassis unit 1, as shown in drawing 17. This loading gear 310 is a spur gear, and the driving force of the loading motor 311 attached in the chassis unit 1 has composition transmitted through transfer gear group 311a.

[0090] \*\* it is shown in the back side face in the back shift plate chassis unit 1 at drawing 17 - drawing 19 -- as -- the post-shift plate 320 -- right and left -- a slide -- it is prepared movable. After this, that horizontal plane is established along the base of the chassis unit 1, and, as for the shift plate 320, the rack 321 for an up-and-down shift is formed in the first transition of this horizontal plane. And the rack 321 for an up-and-down shift is located in the height which engages and releases lower-berth gear 310c of the loading gear 310 according to slide migration of the post-shift plate 320.

[0091] Moreover, the post-shift plate 320 serves as a vertical plane started along the rear face of the chassis unit 1. As shown in drawing 18 and drawing 19, the posterior part stair-like cam 322 of one articles which becomes low according to the right (from the right to the left [ Seeing from a transverse-plane side. ]) is formed in this vertical plane from the left.

[0092] \*\* As the link plate link plate 330 is shown in drawing 17, it is a sector member and the top-most-vertices section 331 is attached in the outsole side of the chassis unit 1 rotatable. Moreover, the right end section of the radii part of the link plate 330 is connected with the left end section of the horizontal plane of the post-shift plate 320 rotatable. Furthermore, near the pars intermedia of the radii

part of the link plate 330, after projecting horizontally back, the floating lock pawl 332 is formed.

[0093] \*\* the left shift plate left shift plate 340 is shown in drawing 17 , drawing 20 , and drawing 21 -- as -- the left side face of the chassis unit 1 -- order -- a slide -- it is prepared movable. That horizontal plane is established along the base of the chassis unit 1, and, as for this left shift plate 340, the left end section of the radii part of the link plate 330 is connected with the back end of this horizontal plane rotatable.

[0094] Moreover, the left-hand side of the left shift plate 340 serves as a vertical plane started along the rear face of the chassis unit 1. As shown in drawing 20 and drawing 21 , the left part stair-like cam 341 of two articles which becomes low according to the front is formed in this vertical plane from back. Furthermore, the left floating lock pawl 343 projected at a level with a left is formed in the vertical plane of the left shift plate 340.

[0095] \*\* The up-and-down chassis up-and-down chassis 350 is the plate of the horizontal plane of an abbreviation L typeface over the left part from the back side of the chassis unit 1, as shown in drawing 17 . the configurations with this following up-and-down chassis 350 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable. That is, as shown in drawing 18 , the vertical plane along the back side face of the chassis unit 1 is formed in the posterior part of the up-and-down chassis 350, and one up-and-down guide pin 351 is formed in this vertical plane. this up-and-down guide pin 351 -- the posterior part stair-like cam 322 of the post-shift plate 320 -- a slide -- it is inserted in movable.

[0096] Moreover, as shown in drawing 20 , two up-and-down guide pins 351 are formed in the left part of the up-and-down chassis 350. this up-and-down guide pin 351 -- the left part stair-like cam 341 of the left shift plate 340 -- respectively -- a slide -- it is inserted in movable.

[0097] \*\* On the above drive unit up-and-down chassis 350, as shown in drawing 22 , the drive unit 360 to which a tray 110 is moved is formed. This drive unit 360 is constituted by a drive motor 361, the A gear - I gears 362a-362i, the Maine rack 363, the 1st cam gear 364, the 2nd cam gear 365, the tray slide link 366, the trace rider 367, and the disk catch lever base 368 grade.

[0098] The A gear - E gears 362a-362e are two or more gears which transmit the driving force of a drive motor 361 to the Maine rack 363, as shown in drawing 22 - drawing 25 . the Maine rack 363 -- right and left -- a slide -- it is the member prepared movable, and as shown in drawing 25 , continuation rack section 363b which followed intermittent rack section 363a which has an intermission in the middle is prepared in the duplex. And F gear 362f is prepared in intermittent rack section 363a possible [ engaging and releasing ], and continuation rack section 362b is engaging with E gear 362e. Upheaval marginal 363c of the shape of a straight line parallel to intermittent rack section 363a and continuation rack section 363b is prepared in this Maine rack 363. Furthermore, 363d of straight-line-like cave-in edges is formed in the pars intermedia of upheaval marginal 363c. And rotation of F gear 362f has composition transmitted to the 1st cam gear 364 and the 2nd cam gear 365 through G gear 362 g-I gear 362i.

[0099] As the 1st cam gear 364 is shown in drawing 26 (A) - (D) and drawing 27 (E) - (H), it is a disc-like spur gear, and top tray slide cam-groove 364a is formed in the top face, and bottom tray slide cam-groove 364b is formed in the inferior surface of tongue. Top tray slide cam-groove 364a is the cam groove in which the narrow diameter portion of a semicircle and the major diameter of a semicircle were formed continuously. Bottom tray slide cam-groove 360b is the cam groove in which the induction prepared in the periphery edge, the pars intermedia extended at the periphery side which counters [ near central ], and the radii section of a minor diameter were formed continuously.

[0100] The tray slide link 366 is formed such near the 1st cam gear 364. As for the tray slide link 366, the back end is horizontally attached in the up-and-down chassis 350 rotatable. Near the back end of this tray slide link 366, pin 366a inserted in top tray slide cam-groove 364a of the 1st cam gear 364 is prepared.

[0101] moreover -- the tray slide link 366 -- the trace rider 367 -- a slide -- it is prepared movable. Between this trace rider 367 and the tray slide link 366, as shown in drawing 30 (I) - (L), the extension spring 369 is attached. And near the back end of the trace rider 367, pin 367a inserted in bottom tray slide cam-groove 364b of the 1st cam gear 364 is prepared. Furthermore, horseshoe-shaped grasping

section 367b which engages and releases the 1st tray support pawl 111 of a tray 110 is prepared in the front end of the trace rider 367.

[0102] On the other hand, the 2nd cam gear 365 is the disc-like spur gear formed in the 1st cam gear 364 and same axle rotatable, as shown in drawing 22. As shown in drawing 28 (A) - (D) and drawing 29 (E) - (H), disk catch cam-groove 365a is formed in the top face of this 2nd cam gear 365. This disk catch cam-groove 365a is the cam groove in which the narrow diameter portion of the shape of radii near a core and the major diameter of the shape of radii near a rim were formed continuously.

[0103] The disk catch lever base 368 is formed such near the 2nd cam gear 365. This disk catch lever base 368 is established in the tray slide link 366 and the same axle rotatable [ that back end ] on the up-and-down chassis 350. Near the back end of this disk catch lever base 368, pin 368a inserted in disk catch cam-groove 365a of the 2nd cam gear 365 is prepared. Moreover, the disk catch lever base 368 is formed possible [ vertical movement ] in accordance with the rotation shaft, and is caudad energized by compression coil spring 368b.

[0104] Furthermore, as shown in drawing 30 (I) - (L), the back end of the disk catch lever 370 is prepared in the disk catch lever base 368 rotatable up and down. This disk catch lever 370 is held by torsion coiled spring 370a so that that include angle may be located on the same horizontal plane as the disk catch lever base 368. Furthermore, press pawl 370b which presses character section 117a of KO of the disk catch link 117 is prepared at the tip of the disk catch lever 370.

[0105] 1-5. Explain the swing unit 400 transferred between the magazine cases 100 by which swing unit division was carried out according to drawing 22, drawing 31 - drawing 34. In addition, let the upper part of drawing 22 into back, and let a lower part be the front. This swing unit 400 is constituted by the transfer drive 410 and the swing chassis 420 grade. The configuration of each part is as follows.

[0106] \*\* The transfer drive transfer drive 410 is constituted by the power plate 411, the power rack 412, J gear 362j, the spring member 413, the 1st gear lock link 414, and the 2nd gear lock link 415 as shown in drawing 31 (A), (B) and drawing 32 (C), and (D). the power plate 411 is shown in drawing 22 -- as -- the up-and-down chassis 350 -- right and left -- a slide -- it is the plate of the shape of an abbreviation rectangle established movable. Guide hole 411a which is the slot of a cross direction is formed in the left end section of this power plate 411.

[0107] moreover, the back of the power plate [ in / in the power rack 412 / the up-and-down chassis 350 ] 411 -- right and left -- a slide -- it is prepared movable. Rack section 412a of this power rack 412 is prepared in J gear 362j which rotation of C gear 362c is delivered possible [ engaging and releasing ]. Furthermore, upheaval marginal 412b parallel to rack section 412a is formed in the pars intermedia of the power rack 412.

[0108] The 1st gear lock link 414 is an abbreviation triangle-like plate, and it has become rotation shaft 414a attached in the up-and-down chassis 350 rotatable near [ the ] the right top-most-vertices section. Near the top-most-vertices section of the method of the forward left in the 1st gear lock link 414, front contact cylinder 414b which contacts upheaval marginal 363c of the Maine rack 363 is prepared.

Moreover, near the top-most-vertices section of the method of the left rear in the 1st gear lock link 414, back contact cylinder 414c which contacts the first transition of the 2nd gear lock link 415 is prepared.

[0109] The 2nd gear lock link 415 is the member which prepared the extension in the right end of a rectangle-like plate, and the edge of an extension has become rotation shaft 415a attached in the up-and-down chassis 350 rotatable. Lock cylinder 415b which contacts upheaval marginal 412a of the power rack 412 is prepared in the method corner of the left rear of the quadrate part in the 2nd gear lock link 415.

[0110] The spring member 413 is a member which the both ends of a metal wire were set [ member ] to bay 413a, and incurvated middle in the circle configuration. As for this spring member 413, the top-most vertices of that bend are supported by the power plate 411. Moreover, although specification-part 412c projects and is prepared near the pars intermedia of the power rack 412, this specification-part 412c is located between two bays 413a of the spring member 413 so that it may energize in contact with two either of the bay 413a according to slide migration of the power rack 412. In addition, when no energization force has also joined two bays 413a, the elastic force of the spring member 413 is set up so



that bay 413a may become parallel mutually.

[0111] \*\* The swing chassis swing chassis 420 is the plate of the abbreviation shuttle-race-back configuration established on the up-and-down chassis 350, as shown in drawing 22. This swing chassis 420 is formed rotatable centering on the transfer rotation shaft 421 established near that right end section. and -- the right end section of the swing chassis 420 -- guide hole 411a of the power plate 411 -- a slide -- the connection pin 422 inserted in movable is formed. Moreover, the guide pin 423 is formed near the back end of the swing chassis 420. the radii-like transfer rotation guide hole 352,353 where these connection pins 422 and guide pins 423 were formed in the up-and-down chassis 350 -- a slide -- it is inserted in movable. Furthermore, left contact pawl 424a is formed in \*\*\*\*\* of the swing chassis 420, and right contact pawl 424b is formed in the front end section.

[0112] On the other hand, as shown in drawing 20 and drawing 21, when the swing chassis 420 transfers the left shift plate 340 and it is before rotation, the slit 342 for a lock with which left contact pawl 424a engages is formed. Moreover, as shown in drawing 11 and drawing 12, when the swing chassis 420 is transferred, the V character slit 6 with which right contact section 424b engages is formed in the right lateral of the chassis unit 1. Corresponding to change of the height of the swing chassis 420, two or more steps of this V character slit 6 are formed. And after the swing chassis 420 engages with the V character slit 6, the hole 244 for a lock is established in the magazine shift plate 240 so that the swing chassis 420 may be locked. Furthermore, as shown in drawing 22, the stopper 354 with which the swing chassis 424 transfers and the after [ the swing chassis 424 ] left end section contacts before rotation is formed in the up-and-down chassis 350.

[0113] 1-6. Explain the drive unit 500 which plays the disk D by which drive unit selection was made according to drawing 33 (A) - (C). This drive unit 500 is constituted by a turntable 520, the release device 510, the optical pickup 530, and delivery device 540 grade. The configuration of each part is as follows.

[0114] \*\* The turntable 520 is attached on the turntable swing chassis 420. This turntable 520 is formed pivotable by the spindle motor 521. As shown in drawing 34 (A) - (C), the sleeve 522 which is the barrel of a bobbin configuration is formed in the perimeter of the revolving shaft of a turntable 520 movable up and down. Although this sleeve 522 is energized up with the spring 523, since the top face of a sleeve 522 is regulated by pin center, large stopper 522a, vertical movement of a sleeve 522 is restricted to the constant rate. The disk insertion section 524 of the shape of a ring inserted in the hole of the center of Disk D is formed in the perimeter of the sleeve 522 in a turntable 520.

[0115] Inside the disk insertion section 524, the disk hook 525 which moors to the hole of the inserted-in disk D and is held is formed at intervals of [ equal ] three. Mooring section 525a which upheaved so that it might moor to the hole of Disk D is formed in the upper limit outside of the disk hook 525. That lower limit section outside is established in this disk hook 525 rotatable as supporting-point 525b.

Furthermore, since the top-face edge of a sleeve 522 is in contact with the inferior surface of tongue of the inside edge of the disk hook 525 from the lower part, the disk hook 525 is energized with the spring 523 so that the mooring section 525a may open outside.

[0116] \*\* The release device release device 510 is a device in which chucking of the disk D on the above turntables 520 is canceled. namely, -- the swing chassis 424 top -- a turntable 520 -- caudad -- the release plate 511 -- horizontal -- a slide -- it is prepared movable. Release edge 511a which contacts the inclination side face of the sleeve 522 bottom from the optical pickup 530 side is prepared in this release plate 511. Moreover, since the end is attached in the other end of the extension spring 512 fixed to about 530 optical pickup on the swing chassis 424, the release plate 511 is energized at the optical pickup 530 side.

[0117] \*\* As shown in optical pickup, delivery device, and drawing 33 (A) - (C), on the swing chassis 420, the optical pickup 530 and its delivery device 540 are carried. The optical pickup 530 is the head equipped with the lens 531 grade for reading to optical the information recorded on Disk D. The delivery device 540 is a device in which the slide migration of the optical pickup 530 is made to carry out in the direction of a path of the disk D on a turntable 520. namely, the guide rail 541 and feed screw 542 which have been arranged in parallel mutually -- the optical pickup 530 -- a slide -- it is prepared



movable. And the feed screw 542 has pivotable composition by the delivery motor 543.

[0118] Furthermore, near the turntable 520 in the optical pickup 530, the inner circumference pilot switch which detects the most-inner-circumference signal reading station of a disk was prepared, and the switch knob 532 has projected. This switch knob 532 is formed possible [ detection of the disk most inner circumference ] by attaching and detaching to the switch spring 533 prepared on the swing chassis 420 according to migration of the optical pickup 530. In addition, the optical pickup 530 is formed further movable in the direction of disk inner circumference, and the switch spring 533 is formed possible [ elastic deformation ] according to this. Moreover, according to the migration, as for the optical pickup 530, the side face by the side of the turntable 520 is established possible [ attachment and detachment ] to the release plate 511.

[0119] 1-7. Explain the magazine ejection unit 600 for discharging the magazine ejection unit magazine case 100 from the chassis unit 1 below according to drawing 17 and drawing 35 . In addition, let the upper part of drawing 17 into back, and let a lower part be the front. This magazine ejection unit 600 is constituted by a loading plate 610, the loading arm 620, the extrusion member 630, the Power Lok link 640, and the magazine lock 650. The configuration of each part is as follows.

[0120] \*\* the loading plate loading plate 610 is shown in drawing 35 -- as -- the outsole side of the chassis unit 1 -- right and left -- a slide -- it is the plate prepared movable. The small rack 611 which engages with the loading gear 310 is formed in the trailing edge of a loading plate 610. And the Power Lok guide 615 which is the guide hole of a horizontal L typeface is formed in the posterior part of a loading plate 610. Moreover, the clipping section 612 is formed in the anterior part of a loading plate 610. This clipping section 612 is ramp 612b toward which the right half part inclined in horizontal level 612a of a longitudinal direction, and the left half inclined ahead. Furthermore, the hook 613 is formed in the first transition of a loading plate 610.

[0121] \*\* The loading-arm loading arm 620 is attached in the location which laps with the loading plate 610 in the outsole side of the chassis unit 1 rotatable centering on the rotation shaft 621, as shown in drawing 17 . The heights 622 which engaged with the clipping section 612 of a loading plate 610 are formed in the left end section of this loading arm 620. The hook 623 is formed near the rotation shaft 621 in a loading arm 620. The both ends of an extension spring 614 are being engaged between the hook 613 of a loading plate 610, and the hook 623 of a loading arm 620. And the right end of a loading arm 620 is connected with the back end of the extrusion member 630 rotatable.

[0122] \*\* the extrusion member extrusion member 630 -- the chassis unit 1 -- order -- a slide -- it is prepared movable. When the magazine case 100 is inserted, the catch section 631 which engages with hollow 131c of the inferior-surface-of-tongue plate 131 is formed in the front end section of this knockout member 630.

[0123] \*\* As shown in drawing 17 and drawing 35 , the Power Lok link 640 which transmits slide migration of a loading plate 610 to the post-shift plate 320 is established in the Power Lok link pan. This Power Lok link 640 is the plate of the shape of a typeface of \*\*, it is prepared in the left rear section of the base of the chassis unit 1 rotatable centering on the rotation shaft 643, and the guide pin 644 of that back end is connected with the post-shift plate 320 rotatable. A guide pin 641 is formed in the middle corner of the Power Lok link 640, and this guide pin 641 is inserted in the Power Lok guide 615 of a loading plate 610. Furthermore, the left end of the torsion coiled spring 642 is connected with the right end of the Power Lok link 640 rotatable, and the right end of this torsion coiled spring 642 is attached in it rotatable on the base of the chassis unit 1.

[0124] \*\* It is the plate of the typeface to the magazine lock magazine lock 650, and is prepared in the right rear section of the base of the chassis unit 1 rotatable centering on the rotation shaft 651. The lock projection 652 which engages and releases 131d of locked slots of the inferior-surface-of-tongue plate 131 is formed in the front end of this magazine lock 650. Moreover, a guide pin 653 is formed in the back end of the magazine lock 650, and this guide pin 653 is inserted in the lock guide hole 323 formed in the horizontal plane of the rack 321 for an up-and-down shift. In addition, the lock guide hole 323 is a guide hole on a straight line on either side, and the left end section has shifted ahead.

[0125] 1-8. a floating lock device -- make the chassis unit 1 equipped with the above devices into

floating by absorber support at the time of playback Of Disk D, and explain the floating lock device made into a floating lock condition at the time of standby. That is, as shown in drawing 1, the chassis unit 1 is held in the case unit 10 which is a larger case than this. Every one damper 11 is fixed to Hidari's medial surface in this case unit 10 forward and backward, and one damper 11 is being fixed to the right medial surface in the center. As for the chassis unit 1, floating support of the perimeter is carried out by these absorbers 11.

[0126] Moreover, the left floating lock plate 12, the right floating lock plate 13, and the post-floating lock plate 14 which upheaved inside are prepared in right and left of the case unit 10, and a back medial surface. Left lock slit 12a, right lock slit 13a, and post-lock slit 14a are formed in these floating lock plates, respectively.

[0127] On the other hand, the left floating lock pawl 343, the right floating lock pawl 243, and the post-floating lock pawl 332 which engage and release left lock slit 12a, right lock slit 13a, and post-lock slit 14a, respectively are formed in the left shift plate 340, the magazine shift plate 240, and the link plate 330 which were prepared in the chassis unit 1 side.

[0128] Moreover, left side plate 12b and right side plate 13b which the left floating lock pawl 343 and the right floating lock pawl 243 which engaged with left lock slit 12a and right lock slit 13a contact are prepared in the medial surface of the case unit 10. Furthermore, between the four corners of the chassis unit 1, and the four corners of the case unit 10, the damper spring 15 which is an extension spring, respectively is formed.

[0129] In addition, although illustration is not carried out, the switch and sensors for switching starting of the magazine shift motor 221, the loading motor 311, a drive motor 361, a spindle motor 521, and delivery motor 543 grade are arranged as follows at the chassis unit 1.

[0130] That is, the loading start switch which detects the inserted magazine case 100 having drawn and having come to the starting position, and the ejection and the switch which detect the completion of discharge of the magazine case 100 are formed in the chassis unit 1 by contacting the edge of a loading arm 620.

[0131] Moreover, the height of the magazine electrode holder 210 is set as the three-stage of a magazine insertion discharge location (the minimum location), a disk chucking location (mid-position), and a magazine open position (the highest location). And corresponding to the location of these magazine electrode holders 210, the magazine closing switch which detects the minimum location, the chucking switch which detects the mid-position, and the magazine opening switch which detects the highest location are formed in the chassis unit 1 so that it may become detectable about each location of the magazine shift plate 240. Furthermore, the photosensor which detects rise and fall of the up-and-down chassis 350 is formed in the chassis unit 1.

[0132] [-- 2. -- operation] of the gestalt of operation -- the outline of the above actuation of the gestalt of this operation is as following A-M.

[0133] [A] If a user inserts the magazine case 100 from the magazine insertion opening 2 of the chassis unit 1, the magazine case 100 will be drawn by the magazine ejection unit 600 in the chassis unit 1 (magazine loading actuation).

[0134] [B] By the up-and-down unit 300, raise the up-and-down chassis 350 and choose the division location of the magazine case 100 (disk selection actuation).

[0135] [C] By the trace rider 367 of the drive unit 360, move a tray 110 and cancel the lock of the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (magazine lock discharge actuation).

[0136] [D] By the magazine shift unit 200, the magazine electrode holder 210 is raised, raise the magazine top-face section 120, divide the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 up and down, and secure the transfer tooth space of the swing unit 400 (magazine division actuation).

[0137] [E] Transfer the swing chassis 420 by the swing unit 400 between the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (swing unit transfer actuation).

[0138] [F] Drop the magazine electrode holder 210 by the magazine shift unit 200, and set the disk D

held at the tray 110 of the bottom in the magazine top-face section 120 on a turntable 520 (disk chucking actuation).

[0139] [G] By the magazine shift unit 200, raise the magazine electrode holder 210 and secure the playback tooth space of Disk D (magazine evacuation actuation).

[0140] [H] Play the disk D on a turntable 520 by the optical pickup 530 (disk playback actuation).

[0141] After dropping the magazine electrode holder 210 by [I] magazine shift unit 200 and holding the disk D on a turntable 520 on a tray 110 again, the magazine electrode holder 210 is raised and a tray 110 is released from on a turntable 520 (disk re-receipt actuation).

[0142] [J] Shake out the swing chassis 420 by the swing unit 400 from between the magazine top-face section 120 and the magazine inferior-surface-of-tongue sections 130 (swing unit start actuation).

[0143] [K] Drop the magazine electrode holder 210 and make the magazine top face 120 and the magazine inferior-surface-of-tongue section 130 coalesce by the magazine shift unit 200 (magazine coalesce actuation).

[0144] [L] Drop the up-and-down chassis 350 and return to an initial valve position (up-and-down chassis downward actuation).

[0145] [M] Discharge the magazine case 100 from the magazine insertion opening 2 by the magazine ejection unit 600 (disk discharge actuation).

[0146] Hereafter, these actuation is explained in full detail. In addition, although the following explanation explains the example of operation at the time of choosing the disk D in the 3rd step of tray 110 in a disk magazine, the tray 110 of other stages can also be freely chosen by adjusting the location of the stair-like cam 322,341 and changing the rise-and-fall location of the up-and-down unit 300 according to a disk selection command.

[0147] 2-1. The magazine case 100 with which the magazine insertion actuation \*\* magazine coalesce condition chassis unit 1 is equipped is in the lock condition that division with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 was regulated, as shown in drawing 36. That is, as the top slit sections 122a-124a of the maximum upper case are shown in drawing 6 (A), it is formed for a long time than other stages, and the tray support pawls 111-113 of the maximum upper case inserted in this are formed for a long time than other stages.

[0148] The condition since it has this composition, before moving a tray 110, namely, in the condition that the tray support pawls 111-113 of all stages have visited the direction of the bottom slit sections 132a-134a Only the tray support pawls 111-113 of the maximum upper case were located ranging over the boundary of the top slit sections 122a-124a and the bottom slit sections 132a-134a, and the tray support pawls 111-113 of the lower berth are completely contained in the bottom slit section 132a - 134a side.

[0149] Thus, since it is regulated that both the slit sections 122a-124a, and 132a-134a shift in the vertical direction by straddling the boundary of the top slit sections 122a-124a and the bottom slit sections 132a-134a, the tray support pawls 111-113 of the maximum upper case are in the lock condition which the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 cannot divide up and down.

[0150] Moreover, the edge of the tray lock link 137 is engaging with the right rear edge of each tray 110. And the bottom trace pulling 125 and the bottom trace pulling 139 are in contact with stop projection 112a of each tray 110. Therefore, the migration is regulated and, as for the tray 110, the lock condition is held.

[0151] into this magazine case 100, Disk D inserts corresponding to each tray 110 -- having -- each disk D -- the 1- since it is held by the 3rd disk catch's 114-116 disk attaching parts 114a-116, the elutriation of Disk D is prevented.

[0152] The more concrete insertion of Disk D is as follows. That is, the slide migration of the disk locking lever 136 is made to carry out rightward by moving control unit 136c with a finger, as shown in drawing 7 (B). When this disk locking lever 136 contacts the edge of the tray lock link 137, that movement magnitude is regulated. Then, since it moves in the direction which pressed pawl 114b to the 1st disk catch's 114 press section 136b leaves, the rotation lock of the 1st disk catch 114 and the 2nd

disk catch 115 is canceled. <BR> [0153] in this condition, when Disk D is inserted, it is shown in drawing 37 -- as -- the 1- it is equipped with Disk D, while the 3rd disk catch 114-116 rotates so that those disk attaching parts 114a-116a may be pushed on the edge of Disk D and may evacuate.

[0154] And if a hand is lifted from the disk locking lever 136, the disk locking lever 136 will return leftward according to the energization force of torsion coiled spring 136e. Then, since the 1st disk catch's 114 pressed pawl 114b presses press section 136b, rotation of the 1st disk catch 114 and the 2nd disk catch 115 is locked. Therefore, the edge of Disk D is held by the disk attaching parts 114a-116a, and the elutriation of Disk D is prevented.

[0155] \*\* As the initial state which is not inserting the magazine case 100 shows initial-state one side and a disk unit to drawing 17 , the extrusion member 630 is ahead and the small rack 611 of a loading plate 610 has geared with the loading gear 310. Moreover, the rack 321 for an up-and-down shift of the post-shift plate 320 is in the right-hand side of the loading gear 310, and is in the condition of not being engaged.

[0156] In addition, at the time of insertion and discharge of the magazine case 100, since the chassis unit 1 is in a floating lock condition and it is positioned by the case unit 10, insertion and discharge become easy.

[0157] \*\* in the condition of \*\*\*\*\* of a magazine case, as shown in drawing 17 , when the magazine case 100 was inserted from the magazine insertion opening 2 of the chassis unit 1 towards the corner of the shape of the radii serving as a method of the left rear, the catch section 631 of the extrusion member 630 was formed in the inferior-surface-of-tongue plate 131 -- become depressed and engage with 131c. Moreover, as shown in drawing 9 , the edge of right and left of the magazine top-face section 120 is inserted between the magazine electrode holder 210 and its bottom grasping pawl 210b, and the edge of right and left of the magazine inferior-surface-of-tongue section 130 is inserted between the chassis unit 1 and bottom grasping pawl 2a.

[0158] \*\* If the magazine case 100 is back stuffed into a loading initiation pan, since the extrusion member 620 will carry out slide migration in back and will press the left end of a loading arm 620 back, a loading arm 620 rotates counterclockwise. Then, since the edge of a loading arm 620 presses the loading start switch which is not illustrated, the loading motor 311 starts. The driving force of the loading motor 311 is transmitted through transfer gear group 311a, and the loading gear 310 rotates it counterclockwise.

[0159] As mentioned above, since the loading gear 310 is engaging with the small rack 611 of a loading plate 610, a loading plate 610 carries out slide migration of it rightward by rotation of the counterclockwise rotation of the loading gear 310. Then, since the heights 622 of a loading arm 620 move to ramp 612a of the clipping section 612 of a loading plate 610 as shown in drawing 38 , a loading arm 620 rotates counterclockwise further and moves the extrusion member 630 back. Therefore, the catch section 631 which engaged with hollow 131c draws the magazine case 100 back further.

[0160] Moreover, if a loading plate 610 carries out slide migration rightward, the guide pin 641 of the Power Lok link 640 will be energized rightward in contact with the left end of the Power Lok guide 615. Then, the Power Lok link 640 rotates counterclockwise, and the post-shift plate 320 is energized leftward by the energization force of the torsion coiled spring 642, and carries out slide migration according to it.

[0161] On the other hand, the magazine lock 650 has the guide pin 653 in the left end section of the lock guide hole 323 at the time of un-inserting the magazine case 100. In this condition, if the magazine case 100 is inserted as mentioned above, the lock projection 652 will be inserted in 131d of locked slots formed in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130. And since a guide pin 653 will move from the left end section of the lock guide hole 323 as shown in drawing 36 if the post-shift plate 320 carries out slide migration leftward as mentioned above, the magazine lock 650 rotates slightly counterclockwise and the lock projection 652 goes into the front end of 131d of locked slots.

[0162] \*\* rotation of a tray lock link -- as mentioned above, if the magazine case 100 is inserted in the chassis unit 1, as shown in drawing 39 (A) - (B), the tray lock discharge pawl 4 will go into the

discharge pawl guide 138, and will press the tray lock link 137 from back. Then, since the tray lock link 137 resists the energization force of torsion coiled spring 137a and is rotated counterclockwise, the engagement to the right rear edge of a tray 110 separates, and a lock is canceled.

[0163] \*\* Since the engagement of the small rack 611 of a loading plate 610 to the loading gear 310 separates when the loading completion extrusion member 630 arrives at the last edge, a loading plate 610 suspends slide migration and a loading arm 620 remains in a loading completion location.

[0164] 2-2. the drive of a shift-after disk selection actuation \*\* plate -- as mentioned above, if the post-shift plate 320 carries out slide migration leftward, the rack 321 for an up-and-down shift will engage with the loading gear 310 rotated counterclockwise. Then, since the post-shift plate 320 carries out slide migration leftward further, the up-and-down guide pin 351 of the posterior part of the up-and-down chassis 350 is energized up by the posterior part stair-like cam 322 of one articles shown in drawing 18 and drawing 19.

[0165] \*\* Since the back end of the link plate 330 connected with the drive coincidence of a left shift plate at the left end of the post-shift plate 320 is energized leftward, the link plate 330 rotates counterclockwise. The left shift plate 340 connected with the front end of the link plate 330 is energized ahead, and carries out slide migration. Therefore, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is energized up by the left part stair-like cam 341 of the left shift plate 340 shown in drawing 20 and drawing 21. In addition, according to migration to the front of the left shift plate 340, left contact pawl 424a of the swing chassis 420 separates from the slit 342 for a lock.

[0166] \*\* a rise of an up-and-down chassis and a halt -- as mentioned above, since the up-and-down guide pin 351 is energized up, the up-and-down chassis 350 goes up gradually from the location of the tray 110 of the bottom. And if detected by the photosensor which it does not illustrate that the up-and-down chassis 350 came to the location corresponding to the desired tray 110 (here a top to the 3rd step of tray 110), a stop signal will be sent to the loading motor 311, and the loading gear 311 will stop. Therefore, the post-shift plate 320 and the up-and-down chassis 350 stop.

[0167] 2-3. In the initial state of the magazine lock discharge actuation \*\* initial-state drive unit 360, as shown in drawing 26 (A), pin 366a of the tray slide link 366 is in the narrow diameter portion of top tray slide cam-groove 364a in the 1st cam gear 364. Therefore, the trace rider 367 is rotated counterclockwise and grasping section 367b at the tip of the trace rider 367 has an include angle which separates from the 1st tray support pawl 111 of a tray 110. In addition, since pin 367a of the trace rider 367 is in the induction of bottom tray slide cam-groove 364b at this time, the trace rider 367 has been ahead extended according to the energization force of an extension spring 369.

[0168] \*\* the rise of a drive unit -- from the above initial states, if disk selection actuation by rise of the up-and-down chassis 350 is performed as mentioned above, the drive unit 360 will go up with a rise of the up-and-down chassis 350. Then, the tray support pawl 111 of the tray 110 of the stage beyond it counters grasping section 367b of the trace rider 367 further with the 1st support pawl 111 of the desired tray 110 (suppose that the 3rd step of tray 110 was chosen from the top in this example).

[0169] \*\* Start migration of a tray, next a drive motor 361, and rotate the 1st cam gear 364 clockwise. That is, if a drive motor 361 operates, rotation of a shaft will be transmitted to C gear 362c from A gear 362a, and C gear 362c will rotate clockwise. Rotation of C gear 362c is transmitted to E gear 362e through D gear 362d, and E gear 362e rotates it clockwise. Since E gear 362e is engaging with continuation rack section 363b of the Maine rack 363 as shown in drawing 25, the Maine rack 363 carries out slide migration leftward by rotation of the clockwise rotation of E gear 362a. Then, F gear 362f which is engaging with intermittent rack section 363a rotates clockwise. Since rotation of F gear 362f is transmitted to the 1st cam gear 364 through -I gear 362i, the 1st cam gear 364 rotates clockwise.

[0170] As mentioned above, since pin 366a of the tray slide link 366 will go into the major diameter of top tray slide cam-groove 364a as shown in drawing 26 (B) if the 1st cam gear 364 rotates clockwise, the tray slide link 366 rotates clockwise. Then, grasping section 367b of the trace rider 367 engages with the 1st tray support pawl 111 of the tray 110 of three sheets which counters this. If the cam gear 365 furthermore rotates clockwise, pin 367a of the trace rider 367 will go into the pars intermedia of a bottom tray slide cam groove. Then, since the energization force of an extension spring 369 is resisted

and the trace rider 367 moves back as shown in drawing 26 (C), as shown in drawing 40, each tray 110 moves back by grasping section 367b which engaged with the 1st tray support pawl 111. Thus, if a tray 110 moves, as shown in drawing 41 (A) and (B), 110d of lobes formed in the tray 110 will go into slit 212a of the tray guide 212 corresponding to this.

[0171] \*\* if the tray 110 of three sheets of the discharge upper case of a lock moves -- the 1- of the perimeter -- the 3rd tray support pawl 111-113 is shown in drawing 6 (B) -- as -- the 1- go into the slits 122a-124a of the 3rd top slit section 122-124. this time -- the 1- of the maximum upper case -- the 3rd tray support pawl 111-113 -- the 1- the 3rd top slit section 122-124 and the 1- since it moves to the 1st - 3rd top slit section 122-124 side, the member which regulates a gap of the vertical direction of both the slit section of a top and the bottom disappears from the boundary part of the maximum upper case with the 3rd bottom slit section 132a-134a. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the condition that the lock was canceled.

[0172] In addition, a tray 110 is energized by the initial valve position by the bottom trace pulling 139 by the side of the magazine inferior-surface-of-tongue section 130, and is energized by the bottom trace pulling 125 by the side of the magazine top-face section 120 in the disengageable location. Therefore, even when a magazine is divided, location regulation of a tray 110 is possible and the fluctuation and elutriation by vibration are prevented.

[0173] \*\* a halt of a tray gear -- since the cam gear 364 will rotate clockwise further and pin 366a of the tray slide link 366 will go into the narrow diameter portion of top tray slide cam-groove 364a as shown in drawing 26 (D) if a tray 110 carries out specified quantity migration as mentioned above, the tray slide link 366 rotates counterclockwise. Then, grasping section 367b of the trace rider 367 separates from the 1st tray support pawl 111. On the other hand, pin 367a of the trace rider 367 goes into the radii section of bottom tray slide cam-groove 364b. Then, the trace rider 367 moves ahead according to the energization force of an extension spring 369.

[0174] In addition, as shown in drawing 28 (A) - (D), the 2nd cam gear 365 is also rotated with the 1st cam gear 364 in process of migration of the tray 110 by the above trace riders 367, but since pin 368a of the disk catch lever base 368 is in the narrow diameter portion of disk catch cam-groove 365a, the disk catch lever base 368 is not changed.

[0175] 2-4. a rise of a magazine division actuation \*\* magazine electrode holder -- start the magazine shift motor 221 and rotate a cylindrical cam 220, after canceling the lock condition of the magazine case 100 as mentioned above. Then, if it is formed in the perimeter of a cylindrical cam 220 as shown in drawing 10, the electrode-holder guide pin 211 of Hidari of the magazine electrode holder 210 will be energized up by plug-like cam 220a. Disc-like gear 220c of a cylindrical cam 220 makes coincidence rotate the 2nd disk section 232 through the 1st disk section 231, as shown in drawing 8. Since the rack 241 for a magazine shift of the magazine shift plate 240 is engaging with circular gear 232b of the 2nd disk section 232, the magazine shift plate 240 carries out slide migration with rotation of the 2nd disk section 232 in back. Therefore, as shown in drawing 12, the electrode-holder guide pin 211 on the right of the magazine electrode holder 210 is energized up by the inclination cam die 242 formed in the magazine shift plate 240.

[0176] Thus, if the electrode-holder guide pin 211 is energized up, as shown in drawing 14, the magazine electrode holder 210 will go up even to a magazine open position (the highest location), the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch which is not illustrated, and the magazine shift motor 221 will stop.

[0177] \*\* If the link plate 330 rotates counterclockwise in the case of the rise of the above-mentioned up-and-down chassis 350 which is discharge of a floating lock, the post-floating lock pawl 332 will separate from post-lock slit 14a of the post-floating lock plate 14. Moreover, if the left shift plate 340 carries out slide migration ahead, the left floating lock pawl 343 will separate from left lock slit 12a of the left floating lock plate 12. Furthermore, since the lock pawl 243 will separate from right lock slit 13a as shown in drawing 15 and drawing 16 if the magazine shift plate 240 moves back in the case of a rise of the above-mentioned magazine electrode holder 210, after mentioning above, a floating lock is completely canceled with discharge of the lock to the floating lock pawl 332 and the left floating lock

pawl 343, and the chassis unit 1 has become floating by absorber 11 support before division of a magazine.

[0178] \*\* division of a magazine -- as a rise of the above magazine electrode holders 210 shows to drawing 10 and drawing 12, although the magazine top-face section 120 grasped by bottom grasping pawl 210b is raised with the tray 110 of three sheets, since the magazine inferior-surface-of-tongue section 130 is grasped by bottom grasping pawl 2a of the chassis unit 1, it remains caudad with the tray 110 of two sheets. Therefore, the magazine case 100 will be divided up and down in the interior of the chassis unit 1.

[0179] Since the guide shaft 3 inserts in insertion hole 210a of the magazine electrode holder 210 and is further inserted in the guide hole 126 of the magazine top-face section 120 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated. And as the tray 110 of three sheets lifted with the magazine top-face section 120 is shown in drawing 41 (A) and (B), 110d of the lobe is contained in slit 212a of the tray guide 212. therefore, the support around each tray 110 -- the 1- if it totals with the support for the 3rd tray support pawl 111-113, four points will be supported and it will not hang down in the specific direction

[0180] 2-5. Start the drive motor 361 of the drive unit 360 again after the completion of division of the migration magazine case 100 of a swing unit transfer actuation \*\* power plate, and make the slide migration of the Maine rack 363 carry out leftward. Then, since front contact cylinder 414b of the 1st gear lock link 414 separates from upheaval marginal 363c of the Maine rack 363 and goes into 363d of cave-in edges as shown in drawing 31 (b), the 1st gear lock link 414 is counterclockwise rotated focusing on rotation shaft 414a. And since back contact cylinder 414c of the 1st gear lock link 414 moves ahead, the 2nd gear lock link 415 has regulation by back contact cylinder 414c solved, and will be in a rotatable condition focusing on rotation shaft 415a.

[0181] Since lock cylinder 415b of the 2nd lock link 415 is in contact with the left-hand side edge of the upheaval marginal 412b, while slide migration of the power rack 412 is regulated by it, the power plate 411 is also having migration regulated by it on the other hand, although the power rack 412 is energized leftward by bay 413a on the right-hand side of the spring member 413 as shown in drawing 31 (A) before a transfer drive. Therefore, since it is shown by the stopper 354 to spite and left contact pawl 424a is pressed down with the left shift plate 340, the swing chassis 420 is locked so that it may not rotate to hard flow with an external impact etc.

[0182] And since the 2nd gear lock link 415 will rotate counterclockwise, lock cylinder 415b will separate from the left-hand side edge of upheaval marginal 412b and it will move to first transition according to the energization force of the power rack 412 as shown in drawing 31 (B) if the 2nd gear lock link 415 will be in a rotatable condition as mentioned above, regulation by lock cylinder 415b is canceled. Then, the power rack 412 carries out slide migration leftward, and the rack section 412a engages with J gear 362j.

[0183] Since the J gear j is engaging with C gear 362c, it is counterclockwise rotated by rotation of the clockwise rotation of C gear 362c. Therefore, as shown in drawing 32 (C), the power rack 412 carries out slide migration leftward further by the J gear j. Moreover, since the power rack 412 and the power plate 411 are connected by the spring member 413, they carry out slide migration also of the power plate 411 leftward with the slide migration to the left of the power rack 412.

[0184] \*\* If the rotation power plate 411 of a swing chassis carries out slide migration leftward, once the connection pin 422 of the swing chassis 420 moves back along with guide hole 411a of the power plate 411, it will move ahead. Therefore, the swing chassis 420 starts rotation counterclockwise centering on the transfer rotation shaft 421. In addition, this rotation is guided when the connection pin 422 and a guide pin 423 move along the transfer rotation guide hole 352,353.

[0185] Thus, if the swing chassis 420 continues rotation, as shown in drawing 42 (A), the swing unit 400 whole will be transferred between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided. And as shown in drawing 42 (B), right contact pawl 424b of the point of the swing chassis 420 engages with the V character slit 6 of the chassis unit 1, and rotation of the swing chassis 420 stops it.



[0186] \*\* Since rack section 412a will separate from J gear 362j as shown in drawing 32 (D) if the power rack 412 continues slide migration leftward by the halt J gear j of a power plate, the power rack 412 stops and the power plate 411 also stops. In coincidence, it separates from lock cylinder 415b of the 2nd gear lock link 415 from the first transition of upheaval marginal 412b of the power rack 412.

[0187] On the other hand, if the Maine rack 363 continues slide migration leftward, since front contact cylinder 414b of the 1st gear lock link 414 will contact upheaval marginal 363c from 363d of cave-in edges of the Maine rack 363, the 1st gear lock link 414 is clockwise rotated focusing on rotation shaft 414a. Then, since back contact cylinder 414c of the 1st gear lock link 414 moves back, the 2nd gear lock link 415 is back energized by back contact cylinder 414c.

[0188] According to the energization force of this back contact cylinder 414c, it rotates clockwise, and the 2nd gear lock link 415 will be in the condition that migration of the power rack 412 was locked, when that lock cylinder 415b contacts the right-hand side edge of upheaval marginal 412b. In addition, since, as for F gear 362f and intermittent rack section 363a of the Maine rack 363, the intermittent sections face, power does not get across to henceforth [ F gear 362f ] in the meantime.

[0189] 2-6. disk chucking actuation -- if the swing unit 400 is transferred as mentioned above, as shown in drawing 34 (B), the turntable 520 of a drive unit 500 will come to the location corresponding to the main hole Of Disk D. In this condition, the delivery motor 543 is driven and the optical pickup 530 is moved to a turntable 520 side. And if the switch knob 532 of the optical pickup 530 moves to inner circumference further after being pressed with the switch spring 533, the release plate 511 will be pressed by the edge of the optical pickup 530. Then, release edge 511a of the release plate 511 presses the inclination side face of the lower part of a sleeve 522. Since the pressed sleeve 522 resists the energization force of a spring 523 and moves caudad, the energization to the disk hook 525 is canceled. In addition, it is possible to perform motion control of the optical pickup 530 for this release plate 511 migration by controlling the delivery motor 543 using a timer.

[0190] And if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position), the location of the magazine shift plate 240 at this time will be detected by the chucking switch which is not illustrated, and the magazine shift motor 221 will stop.

[0191] Thus, if the magazine electrode holder 210 descends to the mid-position, the magazine top-face section 120 held at this will also descend. Then, as shown in drawing 34 (C), the disk D held at the 3rd step of tray 110 in the magazine top-face section 120 is pushed against a turntable 520, and the disk insertion section 524 inserts in the main hole of Disk D. Since the disk hook 525 prepared in the disk insertion section 524 at this time is released from the energization force of a spring 523 as mentioned above, it rotates inside focusing on supporting-point 525b, and mooring section 525a inserts it in the main hole of Disk D.

[0192] And after this mooring section 525a bends down to pass under a main hole, the optical pickup 530 is moved and the press to the release plate 511 is solved. Then, since release edge 511a of the release plate 511 separates from the inclination side face of the lower part of a sleeve 522, a sleeve 522 moves up according to the energization force of a spring 523, and the energization to the disk hook 525 recovers it. Therefore, the disk hook 525 rotates outside according to the energization force of a spring 523, and since mooring section 525a engages with the upper limit of the main hole of Disk D, Disk D is held on a turntable 520. Moreover, at this time, as shown in drawing 29 (E), only the 3rd step of disk catch link 117 of a tray 110 in the magazine top-face section 120 stands face to face against press pawl 370b of the disk catch lever 370.

[0193] 2-7. After rotation disk chucking completion of a disk release actuation \*\* disk catch lever, since pin 368a of the disk catch lever base 368 will go into a major diameter from the narrow diameter portion of disk catch cam-groove 365a as shown in drawing 29 (E), (F), and drawing 30 (J) if the 2nd cam gear 365 rotates clockwise with a drive motor 361, the disk catch lever base 368 rotates clockwise.

[0194] In addition, although the 1st cam gear 364 is also rotated with the 2nd cam gear 365 at this time, as shown in drawing 27 (E) - (H), since the pins 366a and 367a of the tray slide link 366 and the trace rider 367 are in the narrow diameter portion and the radii section of a top and the bottom tray slide cam grooves 364a and 364b, the tray slide link 366 and the trace rider 367 are not changed.



[0195] \*\* If release of a disk, thus the disk catch lever base 368 rotate clockwise, as shown in drawing 29 (F), press pawl 370b of the disk catch lever 370 will move leftward, and will press character section 117a of KO of the 3rd step of disk catch link 117 of a tray 110. then, the 1- by which the disk catch link 117 rotated counterclockwise and was connected with the both ends -- since the 3rd disk catch link 114-116 rotates (refer to drawing 37 ), each disk attaching part 114a-116a releases the periphery of the disk D by which chucking was carried out on the turntable 520.

[0196] 2-8. magazine evacuation actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) after Disk D is released as mentioned above, the location of this magazine shift plate 240 will be detected by the magazine opening switch which is not illustrated, and the magazine shift motor 221 will stop.

[0197] If the magazine electrode holder 210 goes up to the highest location again, the magazine top-face section 120 held at this will also go up. Therefore, it leaves the disk D of one sheet by which chucking was carried out on the turntable 520, the tray 110 of three sheets in the magazine top-face section 120 is lifted, and path clearance required for playback of Disk D is secured.

[0198] Since press pawl 370b is contained in character section 117a of KO at this time as shown in drawing 30 (K), the disk catch lever 370 once rotates up with the migration to the upper part of a tray 110. Then, if the 2nd cam gear 365 rotates further clockwise with a drive motor 361, as shown in drawing 29 (H) and drawing 30 (L), the disk catch lever base 368 resists the energization force of compression coil spring 368b, slide migration will be carried out and the disk catch lever 370 and the disk catch lever base 368 will serve as the same horizontal plane in the upper part. After termination of the 2nd cam gear 365 of operation, the magazine shift motor 221 is started, the magazine shift plate 240 is moved back, and left contact pawl 424a of the swing chassis 420 is locked.

[0199] 2-9. disk playback actuation -- as mentioned above, rotate the disk D on a turntable 520 by starting a spindle motor 521 after making the drive base 510 into floating. And the delivery motor 543 is started, a feed screw 542 is rotated, and read of the information on Disk D and playback are performed by moving the optical pickup 530 along with a guide rail 541.

[0200] Since the chassis unit 1 is in floating supported only by the absorber 11 as mentioned above, the vibration from the outside is absorbed by the absorber 11, the member of a turntable 520 and optical pickup 530 grade is not influenced by vibration, but the exact read of it becomes possible.

[0201] 2-10. Explain the activity which contains again the disk D which ended disk re-receipt actuation playback on the tray 110 in the magazine case 100.

[0202] After suspending rotation of the disk re-grasping actuation turntable 520, a drive motor 361 is started. Counterclockwise the 2nd cam gear 365 \*\* Drawing 29 (G), Rotate to the location shown in drawing 30 (K), and the magazine shift motor 221 is started after that. If the magazine electrode holder 210 is dropped to a disk chucking location (mid-position), it will be detected by the chucking switch which the location of the magazine shift plate 240 at this time does not illustrate, and the magazine shift motor 221 will stop. Thus, if the magazine electrode holder 210 descends to the mid-position again, the 3rd step of tray 110 in the magazine top-face section 120 will touch the disk D on a turntable 520.

[0203] And if a drive motor 361 is started and the 2nd cam gear 365 is counterclockwise rotated, as shown in drawing 29 (G) - (E), since pin 368a of the disk catch lever base 368 will go into the narrow diameter portion of disk catch cam-groove 365a of the 2nd cam gear 365, the disk catch lever base 368 rotates counterclockwise. Thereby, press pawl 370b of the disk catch lever 370 moves to the method of the right, and separates from character section 117a of KO of the disk catch link 117 in the 3rd step of tray 110.

[0204] Then, while the 3rd disk catch 116 rotates according to the energization force of the catch spring 118 in the direction in which the disk attaching part 116a contacts the edge of Disk D, the disk catch link 117 rotates and the 1st and 2nd disk catches 114,115 rotate in the direction in which the disk attaching parts 114a and 115a contact the edge of Disk D (refer to drawing 36 ). Therefore, the perimeter of the disk D by which chucking was carried out on the turntable 520 is again held in the 3rd step of tray 110.

[0205] In addition, at this time, as shown in drawing 27 (G) - (E), the 1st cam gear 364 is also rotated with the 2nd cam gear 365, but since the pins 366a and 367a of the tray slide link 366 and the trace rider

367 are in the narrow diameter portion and the radii section of a top and the bottom tray slide cam grooves 364a and 364b, the tray slide link 366 and the trace rider 367 are not changed.

[0206] \*\* In the condition of the disk chucking discharge actuation above, like the time of disk chucking, move the optical pickup 530 to inner circumference, and cancel the energization force of a spring 523 over the disk hook 525. And if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location), it will be detected by the magazine opening switch which the location of the magazine shift plate 240 at this time does not illustrate, and the magazine shift motor 221 will stop.

[0207] Thus, if the magazine electrode holder 210 goes up to the highest location, the magazine top-face section 120 held at this will also go up. Therefore, the main hole escapes from the disk hook 525 and the disk insertion section 524, and the disk D held by the tray support pawl 111 of the 3rd step of tray 110 goes up with the magazine top-face section 120. Since the engagement force of the disk hook 525 over the main hole of Disk D has become weaker by discharge of the energization force of a spring 523 as mentioned above, desorption of Disk D can be performed smoothly.

[0208] 2-11. swing unit start actuation -- if the drive motor 361 of the drive unit 360 is started and C gear 362c is counterclockwise rotated after canceling chucking Of Disk D as mentioned above, the Maine rack 363 will carry out slide migration rightward. Then, since front contact cylinder 414b of the 1st gear lock link 414 separates from upheaval marginal 363c of the Maine rack 363 and contacts 363d of cave-in edges as shown in drawing 32 (C), the 1st gear lock link 414 is counterclockwise rotated focusing on rotation shaft 414a. And since back contact cylinder 414c of the 1st gear lock link 414 moves ahead, the 2nd gear lock link 415 has regulation by back contact cylinder 414c solved, and will be in a rotatable condition focusing on rotation shaft 415a.

[0209] Since the power rack 412 is energized rightward by the bay on the left-hand side of the spring member 413 at this time as shown in drawing 32 (D), this energization force has joined lock cylinder 415b of the 2nd lock link 415. Therefore, it rotates counterclockwise, and lock cylinder 415b moves ahead and the 2nd gear lock link 415 contacts the first transition of upheaval marginal 412b. Then, the power rack 412 with which regulation by lock cylinder 415b was solved carries out slide migration rightward, and the rack section 412a engages with J gear 362j.

[0210] Since the J gear j is engaging with C gear 362c, it is clockwise rotated by rotation of the counterclockwise rotation of C gear 362c. Therefore, the power rack 412 carries out slide migration rightward further by the J gear j. Since the power rack 412 and the power plate 411 are connected by the spring member 413, they carry out slide migration also of the power plate 411 rightward with the slide migration to the right of the power rack 412.

[0211] If the power plate 411 carries out slide migration rightward, the connection pin 422 of the swing chassis 420 will move back along with guide hole 411a of the power plate 411. Therefore, the swing chassis 420 starts rotation clockwise centering on the transfer rotation shaft 421. In addition, this rotation is guided when the connection pin 422 and a guide pin 423 move along the transfer rotation guide hole 352,353.

[0212] Thus, if the swing chassis 420 continues rotation, as shown in drawing 22 , the swing unit 400 whole will be shaken out from between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided, and will return to the initial valve position of the method of the left rear of the chassis unit 1. At this time, the after [ the swing chassis 424 ] left end section contacts a stopper 354.

[0213] 2-12. descent of a magazine coalesce actuation \*\* magazine electrode holder -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped even to a magazine insertion discharge location (the minimum location) after the swing unit 400 is shaken out as mentioned above, it will be detected by the magazine closing switch which the location of the magazine shift plate 240 at this time does not illustrate, and the magazine shift motor 221 will stop. In addition, the lock pawl 243 engages with right lock slit 13a by migration of the magazine shift plate 240 at this time.

[0214] Thus, as shown in drawing 9 , the magazine top-face section 120 grasped by the descending magazine electrode holder 210 descends with the tray 110 of three sheets, and coalesces in the magazine

inferior-surface-of-tongue section 130 which remained caudad with the tray of two sheets. Since the guide shaft 3 has inserted in insertion hole 210a of the magazine electrode holder 210 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated, and it coalesces correctly.

[0215] \*\* If magazine lock actuation and the 1st cam gear 365 rotate counterclockwise further, as shown in drawing 26 (D) - (B), pin 367a of the trace rider 367 will go into induction through the pars intermedia of bottom tray slide cam-groove 364b. Then, since the trace rider 367 moves ahead, each tray 110 moves ahead by grasping section 367b which engaged with the 1st tray support pawl 111. Thus, if a tray 110 moves, it will separate from 110d of lobes formed in the tray 110 from slit 212a of the tray guide 212 corresponding to this.

[0216] Furthermore, since pin 366a of the tray slide link 366 will go into the narrow diameter portion of top tray slide cam-groove 364a as shown in drawing 26 (A) if the cam gear 365 rotates counterclockwise, the tray slide link 366 rotates counterclockwise. Then, grasping section 367b of the trace rider 367 separates from the 1st tray support pawl 111 of the tray 110 of three sheets which counters this.

[0217] if the tray 110 of three sheets of an upper case moves -- the 1- of the perimeter -- the 3rd tray support pawl 111-113 is shown in drawing 6 (A) -- as -- the 1- it goes into the slits 132a-134a of the 3rd bottom slit section 132-134. this time -- the 1- of the maximum upper case -- the 3rd tray support pawl 111-113 -- the 1- the 3rd top slit section 122-124 and the 1- since it comes to the location over the boundary part of the maximum upper case with the 3rd bottom slit section 132a-134a, a gap of the vertical direction of both the slit section of a top and the bottom is regulated. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the lock condition which cannot be divided.

[0218] 2-13. up-and-down chassis downward actuation -- as mentioned above, start the loading motor 311 and rotate the loading gear 310 clockwise, after completing coalesce and the lock of the magazine case 100. Then, since the post-shift plate 320 carries out slide migration rightward, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the posterior part stair-like cam 322.

[0219] The link plate 330 connected with the left end of the post-shift plate 320 at coincidence rotates clockwise, and the left shift plate 340 connected with the front end of the link plate 330 carries out slide migration in back. Therefore, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the left part stair-like cam 341 of the left shift plate 340.

[0220] As mentioned above, since the up-and-down guide pin 351 is energized caudad, the up-and-down chassis 350 descends and it returns to the early minimum location. Moreover, as mentioned above, if the link plate 330 rotates clockwise, the post-floating lock pawl 332 will engage with post-lock slit 14a of the post-floating lock plate 14. And if the left shift plate 340 carries out slide migration in back, the left floating lock pawl 343 will engage with left lock slit 12a of the left floating lock plate 12. Therefore, the chassis unit 1 will be in an early floating lock condition with the lock to the lock pawl 243 of the magazine shift plate 240 mentioned above.

[0221] 2-14. If the post-shift plate 320 carries out slide migration rightward as mentioned above, the back end of the Power Lok link 640 will be energized rightward by the magazine ejection actuation pan. Then, the Power Lok link 614 rotates clockwise and the Power Lok guide 615 is energized leftward with a guide pin 641. Then, since a loading plate 610 moves leftward and the small rack 611 engages with the loading gear 310, a loading plate 610 carries out slide migration leftward further. And since the heights 622 of a loading arm 620 move to horizontal level 612a of the clipping section 612 of a loading plate 610, a loading arm 620 rotates clockwise and moves the extrusion member 630 ahead.

[0222] On the other hand, the magazine lock 650 has the guide pin 653 in the location on the right of the left end section of the lock guide hole 323 at the time of insertion of the magazine case 100. And if the post-shift plate 320 carries out slide migration rightward as mentioned above, since a guide pin 653 will move to the left end section of the lock guide hole 323, the magazine lock 650 rotates slightly clockwise and the lock projection 652 moves it to the left from the front end of 131d of locked slots.

[0223] Therefore, as shown in drawing 17 , while the back end of the extrusion member 630 extrudes the magazine case 100 ahead, 131d of locked slots formed in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 to the lock projection 652 separates. And if specified quantity discharge of the magazine case 100 is carried out from the magazine insertion opening 2, since a loading arm 620 will press the ejection and the switch which the chassis unit 1 does not illustrate, the loading motor 311 stops and a loading arm 620 remains in the completion location of discharge.

[0224] Thus, if the magazine case 100 moves in the direction discharged from the chassis unit 1, as shown in drawing 39 (C) - (A), the tray lock discharge pawl 4 will separate from the discharge pawl guide 138, and will separate from the tray lock link 137. Then, since the tray lock link 137 is clockwise rotated according to the energization force of torsion coiled spring 137a, the edge of the tray lock link 137 engages with the right rear edge of each tray 110. And the bottom trace pulling 125 and the bottom trace pulling 139 are in contact with stop projection 112a of each tray 110. Therefore, the migration is regulated and, as for the tray 110, the lock condition is held. In this condition, a user pulls out the magazine case 100 from the magazine insertion opening 2.

[0225] Furthermore, the ejection activity of the disk D in the magazine case 100 is as follows. That is, as shown in drawing 7 (B) and drawing 37 , by moving control unit 136c with a finger, the slide migration of the disk locking lever 136 is made to carry out rightward, and the rotation lock of the 1st disk catch 114 and the 2nd disk catch 115 is canceled. And if the disk lever 135 is pushed in with a finger and rotated back, since the edge of Disk D will be pressed and Disk D will be discharged, a finger holds and draws out Disk D using the slitting 110a, 121a, and 131a of the magazine case 100.

[0226] [-- 3. -- effectiveness] of the gestalt of operation -- the effectiveness of the above gestalten of this operation is as follows. That is, since Disk D is played, when a horizontal tooth space can be reduced sharply, for example, it uses as ambulance or vehicle equipment between the magazines divided up and down, the degree of freedom of an installation location increases.

[0227] Moreover, since the desired tray 110 is moved, it drives with the drive motor 361 with common drive unit 360 which performs maintenance of Disk D, and release and transfer drive 410 which transfers the swing chassis 420 and the common loading motor 311 performs loading of the magazine case 110, rise and fall of the up-and-down chassis 350, and floating lock discharge of the chassis unit 1, it is realizable in the miniaturization and power-saving of equipment by reduction of the number of motors.

[0228] moreover, the 1- which moves according to the top slit section 123 and the bottom slit section 132, and migration of each tray 110 -- what is necessary is just to form the drive unit 360 to which a tray 110 is moved, and the up-and-down unit 300 which makes it go up and down the drive unit 360, in order to realize these functions with the 3rd tray support pawl 111-113, since the lock of the magazine case 100 and maintenance of a tray 110 are possible Therefore, according to an easy device, lock of the magazine case 100 and lock discharge, disk selection, and support of a tray 110 can be performed, and a miniaturization and low cost-ization are attained. Since especially migration of a tray 110 is performed by moving the trace rider 367, positive actuation is realizable with a simple device.

[0229] Moreover, since chucking of the disk D to a turntable 520 top and a chucking discharge activity can be easily done by making it go up and down the magazine electrode holder 210, and making the disk hook 525 engage and release the main hole of Disk D, the member for pressing down from Disk D specially is not needed, but simplification of a configuration can be realized. Since migration of the optical pickup 530 by the delivery device 540 can cancel disk chucking on a turntable 520 even if it does not establish a device for a driving source separately especially, simplification of equipment is attained.

[0230] Moreover, in the condition that the swing unit 400 is not transferred, it is engaging with the slit 342 of the left shift plate 340 at the same time the back end is in contact with the stopper 354 of the up-and-down chassis 350. And in the condition that the swing unit 400 was transferred, while the contact pawl 424 at the tip is held by the V character slit 6, it is pressing down by the end face of the hole 244 for a lock of the magazine shift plate 240. Therefore, a variation rate is regulated and fear of time of standby and transfer of deformation of the components by vibration, breakage, and skipping disappears.

[0231] Moreover, although it becomes strong to vibration at the time of playback of Disk D since the chassis unit 1 will be in floating by support of an absorber 11, since the floating lock device is making the left shift plate 340 of the up-and-down unit 300 and the link plate 330, and the magazine shift plate 240 of the magazine shift unit 210 serve a double purpose, while it saves the number of members, certainty of operation can be raised.

[0232] Moreover, since the depth (before or after) direction and the width-of-face (right and left) direction do not take a comparison-tooth space, the miniaturization of the whole equipment of the cylindrical cam 220 of the magazine shift unit 200 is attained. In the tooth space which is easy to secure the depth stroke of this and the opposite side to the swing unit 400 side which cannot secure depth TOROKU especially easily using a cylindrical cam 220, by using the magazine shift plate 240 which does not take a crosswise tooth space, space-efficient member arrangement is attained and the large miniaturization of the whole equipment can be realized.

[0233] Moreover, in case the magazine top-face section 120 goes up and down with the magazine electrode holder 210, since migration is guided when the guide shaft 3 inserts in the guide hole 126, there is no location gap, and division and generating of the malfunction at the time of coalesce are prevented.

[0234] moreover -- since 110d of lobes of a tray 110 is contained in slit 212a of the tray guide 212 in case you make it go up and down the magazine top-face section 120 -- the perimeter of each tray 110 -- the 1- four points in all will be supported with the 3rd tray support pawl 111-113, and it does not hang down in the specific direction

[0235] Moreover, slide migration of the tray 110 in the magazine case 100 can perform the lock and lock discharge of the integrated state of the magazine case 100. Therefore, the special member for the lock of the magazine case 100 is not needed, but simplification of the magazine case 100 can be realized. Moreover, since migration of a tray 110 is linear, smooth actuation is easy to be obtained and it is hard to generate a malfunction.

[0236] Moreover, since slide migration of a tray 110 is regulated by the tray lock link 137 which engages with the edge of a tray 110, and the bottom trace pulling 125 and the bottom trace pulling 135 which contacts stop projection 112a, a user moves [ a tray 110 ] at the time of carrying of the magazine case 100 etc., and a lock is not canceled.

[0237] moreover, the disk D in each tray 110 -- the 1- since it is the three-point support supported by the 3rd disk catch's 114-116 disk attaching parts 114a-116a, the location of Disk D is stabilized. and the 1- since the 3rd disk catch 114-116 is making it interlock by the disk catch link 117, he tends to take the synchronization of each disk attaching parts 117a-116a. using the disk catch link 117 -- the 1- the 3rd disk catch 114-116 can be energized with the single catch spring 118, and the number of members can be saved. Furthermore, since the drive unit 360 side should just also press the disk catch link 117 by the disk catch lever 370, a device can be simplified.

[0238] Moreover, the tray lock link 137 of the magazine case 100 is established in the small tooth space to which the tray lock link 137 and the disk locking lever 136 carry out the movable range in common so that it may become the stopper of the disk locking lever 136 which cancels maintenance of Disk D with hand control. Therefore, while being able to prevent the blank of the disk locking lever 136, the miniaturization of the magazine case 100 is attained.

[0239] Moreover, since side-attachment-wall 127,130a is prepared in the side face of the magazine case 100 only at the part, Disk D can be made into the wrap minimum for the volume of the magazine case 100, and a miniaturization can be attained.

[0240] Moreover, slitting 110a, 121a, and 131a is formed in the tray 110, the magazine top-face section 120, and the magazine inferior-surface-of-tongue section 130 which constitute a disk magazine. For this reason, in case the disk discharge lever 135 is rotated and Disk D is discharged, by holding the edge of the disk D exposed in slitting 110a, 121a, and 131a, it can take out easily, without touching a signal side, and adhesion of the fingerprint at the time of being ejection can be prevented. Furthermore, it is easy to form this slitting 110a, 121a, and 131a, and it does not serve as manufacturing-cost quantity.

[0241] [4. Gestalt] this invention of other operations is not limited to the gestalt of the above operations,

and the number of each part material, a configuration, magnitude, etc. can be changed suitably. For example, as long as the number of the trays 110 in the magazine case 100 is plurality, it may be how many sheets. therefore, it can come out according to this and Slits 122a-123a and the number of 132a-134a can also be changed.

[0242] Moreover, although the gestalt of the above-mentioned operation was the configuration of dividing the magazine case 100 by making it going up and down the magazine top-face section 120, it is also possible by constituting the gestalt of the above-mentioned operation to vertical hard flow, and making it go up and down the magazine inferior-surface-of-tongue section 120 to consider as the configuration which divides the magazine case 100, is made to carry out chucking of the disk D to the turntable 520 which turned to the lower part, and performs disk playback.

[0243] Furthermore, the record medium used for this invention is not limited to CD etc. that what is necessary is just the thing of a disk configuration. Moreover, this invention can also be constituted only as equipment for playback as equipment in which record and playback are possible.

[0244]

[Effect of the Invention] As mentioned above, according to this invention, by the easy device and few driving sources, the lock of a disk magazine and lock discharge, selection of a disk, tray maintenance, disk maintenance, disk release, etc. are realizable, it is small and a reliable disk unit can be offered.

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[Translation done.]

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**TECHNICAL FIELD**

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[Field of the Invention] By choosing a desired disk, starting playback and the disk unit to record out of the disk magazine which held two or more disks, and performing disk selection, playback, and record, where a disk magazine is divided especially up and down, this invention enables contiguity arrangement of each configuration member, and relates to the disk magazine used for the disk unit and this aiming at the miniaturization of the whole equipment.

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**PRIOR ART**

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[Description of the Prior Art] In recent years, the spread of the disk units using a disk as a medium is remarkable like a CD player or MD player. Especially, as a disk unit for mount, the thing of the autochanger type which chooses a desired disk and is reproduced out of the disk magazine which contained two or more disks is developed. Since the disk unit of this autochanger type does not need to take one disk at a time in and out whenever it exchanges the disk to play, it is convenient especially as an object for mount.

[0003] The disk unit using such a disk magazine adjoins the magazine hold section, and the disk playback section is arranged. And after pulling out the disk of the request in a magazine and conveying and setting to the disk playback section according to a conveyance device, there was much what performs disk playback. However, if it is made this configuration, in order to secure the tooth space which sets a disk to the disk playback section and is reproduced, it is necessary to keep a fixed distance between the disk playback sections and the magazine hold sections which were prepared adjacently. Therefore, as a device for mount by which the whole disk unit will large-sized-size, and the installation tooth space was restrained, it was disadvantageous.

[0004] For example, if it sees for the latest audio equipment for mount, the opening dimension by the side of the car which contains it will have been unified into 180x50 (mm) called DIN size or 180x100 (mm) called double DIN size. Moreover, that which gets mixed up 160mm and suits also about the depth dimension of opening is the present condition, and receives constraint of the audio equipment anchoring tooth space of a car.

[0005] On the other hand, since considering that the size of a compact disk is the diameter of 120mm the dimension more than 2= 120x240 (mm) is needed in the longest direction of breadth by the above disk units, it turns out that a device cannot be contained at opening located beside a driver's seat.

[0006] He is trying to contain the inside of the trunk of a car, and near the step of a driver's seat in the conventional CD autochanger from the above situations. However, in the case of the former, there is a fault, like the long line which will not become if open a trunk whenever it is the exchange of a disk to which a trunk tooth space becomes narrow, and it kicks and which connects a trunk and a control unit is needed. Moreover, in the case of the latter, a space part underfoot becomes so narrow, and when a guide peg touches accidentally, it may damage.

[0007] In order to cope with this, a disk magazine is divided up and down and the disk unit which performs disk playback where the disk playback section is transferred between them is proposed as proposed by JP,6-203519,A. Since a disk stowed position and a disk playback location lap, such a disk unit can reduce a horizontal tooth space.

[0008] In addition, usually performs division of a disk magazine with the magazine electrode holder prepared in the chassis unit possible [ rise and fall ]. That is, the configuration of raising a magazine electrode holder with the pin which moves in the inside of a stair-like cam is taken by inserting the pin fixed to the magazine electrode holder in the stair-like cam formed in the cam plate, and carrying out slide migration of this cam plate in order. And by holding a upside disk magazine and raising this magazine electrode holder with a magazine electrode holder, a upside disk magazine is lifted with an



internal tray, and it divides from a lower disk magazine.

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**EFFECT OF THE INVENTION**

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[-- 3. -- effectiveness] of the gestalt of operation -- the effectiveness of the above gestalten of this operation is as follows. That is, since Disk D is played, when a horizontal tooth space can be reduced sharply, for example, it uses as ambulance or vehicle equipment between the magazines divided up and down, the degree of freedom of an installation location increases.

[0227] Moreover, since the desired tray 110 is moved, it drives with the drive motor 361 with common drive unit 360 which performs maintenance of Disk D, and release and transfer drive 410 which transfers the swing chassis 420 and the common loading motor 311 performs loading of the magazine case 110, rise and fall of the up-and-down chassis 350, and floating lock discharge of the chassis unit 1, it is realizable in the miniaturization and power-saving of equipment by reduction of the number of motors.

[0228] moreover, the 1- which moves according to the top slit section 123 and the bottom slit section 132, and migration of each tray 110 -- what is necessary is just to form the drive unit 360 to which a tray 110 is moved, and the up-and-down unit 300 which makes it go up and down the drive unit 360, in order to realize these functions with the 3rd tray support pawl 111-113, since the lock of the magazine case 100 and maintenance of a tray 110 are possible Therefore, according to an easy device, lock of the magazine case 100 and lock discharge, disk selection, and support of a tray 110 can be performed, and a miniaturization and low cost-ization are attained. Since especially migration of a tray 110 is performed by moving the trace rider 367, positive actuation is realizable with a simple device.

[0229] Moreover, since chucking of the disk D to a turntable 520 top and a chucking discharge activity can be easily done by making it go up and down the magazine electrode holder 210, and making the disk hook 525 engage and release the main hole of Disk D, the member for pressing down from Disk D specially is not needed, but simplification of a configuration can be realized. Since migration of the optical pickup 530 by the delivery device 540 can cancel disk chucking on a turntable 520 even if it does not establish a device for a driving source separately especially, simplification of equipment is attained.

[0230] Moreover, in the condition that the swing unit 400 is not transferred, it is engaging with the slit 342 of the left shift plate 340 at the same time the back end is in contact with the stopper 354 of the up-and-down chassis 350. And in the condition that the swing unit 400 was transferred, while the contact pawl 424 at the tip is held by the V character slit 6, it is pressing down by the end face of the hole 244 for a lock of the magazine shift plate 240. Therefore, a variation rate is regulated and fear of time of standby and transfer of deformation of the components by vibration, breakage, and skipping disappears.

[0231] Moreover, although it becomes strong to vibration at the time of playback of Disk D since the chassis unit 1 will be in floating by support of an absorber 11, since the floating lock device is making the left shift plate 340 of the up-and-down unit 300 and the link plate 330, and the magazine shift plate 240 of the magazine shift unit 210 serve a double purpose, while it saves the number of members, certainty of operation can be raised.

[0232] Moreover, since the depth (before or after) direction and the width-of-face (right and left) direction do not take a comparison-tooth space, the miniaturization of the whole equipment of the cylindrical cam 220 of the magazine shift unit 200 is attained. In the tooth space which is easy to secure

the depth stroke of this and the opposite side to the swing unit 400 side which cannot secure depth TOROKU especially easily using a cylindrical cam 220, by using the magazine shift plate 240 which does not take a crosswise tooth space, space-efficient member arrangement is attained and the large miniaturization of the whole equipment can be realized.

[0233] Moreover, in case the magazine top-face section 120 goes up and down with the magazine electrode holder 210, since migration is guided when the guide shaft 3 inserts in the guide hole 126, there is no location gap, and division and generating of the malfunction at the time of coalesce are prevented.

[0234] moreover -- since 110d of lobes of a tray 110 is contained in slit 212a of the tray guide 212 in case you make it go up and down the magazine top-face section 120 -- the perimeter of each tray 110 -- the 1- four points in all will be supported with the 3rd tray support pawl 111-113, and it does not hang down in the specific direction

[0235] Moreover, slide migration of the tray 110 in the magazine case 100 can perform the lock and lock discharge of the integrated state of the magazine case 100. Therefore, the special member for the lock of the magazine case 100 is not needed, but simplification of the magazine case 100 can be realized. Moreover, since migration of a tray 110 is linear, smooth actuation is easy to be obtained and it is hard to generate a malfunction.

[0236] Moreover, since slide migration of a tray 110 is regulated by the tray lock link 137 which engages with the edge of a tray 110, and the bottom trace pulling 125 and the bottom trace pulling 135 which contacts stop projection 112a, a user moves [ a tray 110 ] at the time of carrying of the magazine case 100 etc., and a lock is not canceled.

[0237] moreover, the disk D in each tray 110 -- the 1- since it is the three-point support supported by the 3rd disk catch's 114-116 disk attaching parts 114a-116a, the location of Disk D is stabilized. and the 1- since the 3rd disk catch 114-116 is making it interlock by the disk catch link 117, he tends to take the synchronization of each disk attaching parts 117a-116a. using the disk catch link 117 -- the 1- the 3rd disk catch 114-116 can be energized with the single catch spring 118, and the number of members can be saved. Furthermore, since the drive unit 360 side should just also press the disk catch link 117 by the disk catch lever 370, a device can be simplified.

[0238] Moreover, the tray lock link 137 of the magazine case 100 is established in the small tooth space to which the tray lock link 137 and the disk locking lever 136 carry out the movable range in common so that it may become the stopper of the disk locking lever 136 which cancels maintenance of Disk D with hand control. Therefore, while being able to prevent the blank of the disk locking lever 136, the miniaturization of the magazine case 100 is attained.

[0239] Moreover, since side-attachment-wall 127,130a is prepared in the side face of the magazine case 100 only at the part, Disk D can be made into the wrap minimum for the volume of the magazine case 100, and a miniaturization can be attained.

[0240] Moreover, slitting 110a, 121a, and 131a is formed in the tray 110, the magazine top-face section 120, and the magazine inferior-surface-of-tongue section 130 which constitute a disk magazine. For this reason, in case the disk discharge lever 135 is rotated and Disk D is discharged, by holding the edge of the disk D exposed in slitting 110a, 121a, and 131a, it can take out easily, without touching a signal side, and adhesion of the fingerprint at the time of being ejection can be prevented. Furthermore, it is easy to form this slitting 110a, 121a, and 131a, and it does not serve as manufacturing-cost quantity.

[0241] [4. Gestalt] this invention of other operations is not limited to the gestalt of the above operations, and the number of each part material, a configuration, magnitude, etc. can be changed suitably. For example, as long as the number of the trays 110 in the magazine case 100 is plurality, it may be how many sheets. therefore, it can come out according to this and Slits 122a-123a and the number of 132a-134a can also be changed.

[0242] Moreover, although the gestalt of the above-mentioned operation was the configuration of dividing the magazine case 100 by making it going up and down the magazine top-face section 120, it is also possible by constituting the gestalt of the above-mentioned operation to vertical hard flow, and making it go up and down the magazine inferior-surface-of-tongue section 120 to consider as the

configuration which divides the magazine case 100, is made to carry out chucking of the disk D to the turntable 520 which turned to the lower part, and performs disk playback.

[0243] Furthermore, the record medium used for this invention is not limited to CD etc. that what is necessary is just the thing of a disk configuration. Moreover, this invention can also be constituted only as equipment for playback as equipment in which record and playback are possible.

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[Translation done.]

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**TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention] However, there were the following points which should be improved in the disk unit using the disk magazine of the above block construction. That is, when the device which carries out loading of the disk magazine, the device which chooses the disk to play, the device in which the coalesce condition of a disk magazine is canceled, and a disk magazine are divided, the device in which a tray is held, the device which releases the selected disk from a tray and is set on a turntable are complicated respectively, and there are many driving sources to need. For this reason, many complicated devices needed to be prepared in the perimeter of a disk magazine, and complication of the whole equipment and enlargement were caused.

[0010] Moreover, since there are no tooth-space-allowances in the upper and lower sides of the disk playback section transferred between the divided disk magazines, it is difficult for them from the disk on a turntable to carry out chucking by the usual clasper. Therefore, even if it is a narrow tooth space, development of the simple device in which wearing of a disk and desorption to a turntable can be performed certainly is expected.

[0011] Moreover, the disk playback section of a transfer mold is usually prepared on the swing unit which rotates centering on a revolving shaft. For this reason, when a swing unit is transferred between the divided up-and-down disk magazines, the disk playback section will be supported only by one point of the rotation supporting point of a swing unit, and when it is weak and uses as a disk unit for mount to vibration, it becomes disadvantageous.

[0012] Moreover, at the time of usual [ at the time of carrying and disk insertion etc. ], the disk magazine of an assembled die locks the integrated state, and only at the time of disk playback, a lock needs to be canceled and it needs to be divided. For this reason, it is necessary to have a member only for locks, and the structure of a disk magazine is complicated.

[0013] Moreover, if a gap arises in the location of an up-and-down disk magazine in case the divided disk magazine is made to coalesce again, a malfunction will be produced, without the ability coalescing. If a firm maintenance device tends to be used or it is going to raise location precision in order to cope with this, a complicated mechanism and expensive components will be needed and it will become disadvantageous for a miniaturization and low-cost-izing.

[0014] It is proposed in order to solve the trouble of the above conventional techniques, and the main purpose can realize the lock of a disk magazine and lock discharge, selection of a disk, tray maintenance, disk maintenance, disk release, etc. by the easy device and few driving sources, and this invention is small, and is offering a reliable disk unit.

[0015] The 2nd purpose of this invention is simple structure, and is offering the disk unit which can prevent the location gap at the time of carrying out division coalesce of the disk magazine.

[0016] Even if the 3rd purpose of this invention is a narrow tooth space, it is offering the disk unit equipped with the simple device wearing of a disk and desorption to a turntable being performed certainly.

[0017] The 4th purpose of this invention is offering an advantageous disk unit, when it is strong and uses as a disk unit for mount to vibration.

[0018] The 5th purpose of this invention is a simple internal structure, and is offering the disk magazine which can perform the lock and lock discharge of an integrated state.

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[Translation done.]

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**MEANS**

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[Means for Solving the Problem] In order to solve the above troubles, the disk unit of this invention The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, It is prepared on said swing unit and has the following technical features in the disk unit which has the disk playback section which plays the disk chosen by said disk selection section.

[0020] Invention according to claim 1 namely, said tray It is prepared movable. the inside of said disk magazine -- a slide -- on said tray The lock location which locks a coalesce condition while while is divided and being supported at a disk magazine side according to the migration, It is characterized by preparing the tray supporter material which moves between the lock discharge locations which cancel the lock of a coalesce condition, while being supported at the disk magazine side of another side divided, and preparing the drive unit to which said tray is moved in said disk selection section.

[0021] In the above invention according to claim 1, the tray of the stage more than the tray which equipped with the selected disk by the drive unit is moved. Then, a lock condition is canceled while the tray which moved is supported by tray supporter material at the one side of a disk magazine. And the tray of the stage more than the tray which could come, simultaneously was chosen by the magazine division section when the top-face section of a disk magazine was raised goes up.

[0022] The selected disk is set to the disk playback section by transferring the disk playback section between the divided disk magazines, and dropping the magazine division section in this condition. And after raising one side of a disk magazine and securing up-and-down path clearance, set disk playback is performed in the disk playback section.

[0023] By the magazine division section, after playback termination descends one disk magazine, makes a tray approach the disk on the disk playback section, and holds a disk. Then, the magazine division section is raised and a disk is removed from the disk playback section. Next, shake out the disk playback section, drop the magazine division section, and a disk magazine is made to coalesce again, by the drive unit, a tray is moved and a magazine is made into a lock condition.

[0024] Invention according to claim 2 is characterized by driving said swing unit and said drive unit by the common driving source in a disk unit according to claim 1.

[0025] In the above invention according to claim 2, since a swing unit and a drive unit drive by the common driving source, it becomes saving of the number of members.

[0026] Invention according to claim 3 is set to a disk unit according to claim 1 or 2. On said tray The disk maintenance location holding the disk chosen by said disk selection section, Between [ two or more ] the disk release locations which release a disk are established in a movable disk attachment component in the periphery of a disk. Said disk attachment component It is characterized by being prepared possible [ a synchronization ] and said link member being prepared by said drive unit possible [ a drive ] by the single link member.

[0027] In the above invention according to claim 3, since a drive unit and a single link member perform the maintenance and release of a disk from a tray, a common device can perform lock of a disk magazine and lock discharge, and maintenance and release of a disk, and the simplification of equipment and saving of a tooth space are attained.

[0028] The loading device in which invention according to claim 4 performs drawing in and discharge of said disk magazine to said chassis unit in a disk unit given in any 1 term of claims 1-3 is established, said disk selection section is prepared possible [ rise and fall ] according to the tray equipped with the selected disk, and said loading device and said disk selection section are characterized by driving by the common driving source.

[0029] In the above invention according to claim 4, since a loading device and the disk selection section drive by the common driving source, it becomes saving of the number of members.

[0030] Invention according to claim 5 is set to a disk unit given in any 1 term of claims 1-4. Said disk playback section The turntable on which a disk is laid, and the optical pickup which detects the information recorded on the disk, It has the delivery device to which said optical pickup is moved. On said turntable The disk attachment component which can engage and release the main hole of a disk is prepared, and is characterized by having the release device in which said disk attachment component is made to shift to a disk release condition from a disk maintenance condition according to the energization force of said optical pickup which moves.

[0031] In the above invention according to claim 5, while a disk attachment component can perform wearing of the disk to a turntable top without a clumper, since the release device in which a disk is released is driven by migration of optical pickup, it can omit a special driving source and the miniaturization of the whole equipment of it is attained.

[0032] In invention according to claim 6, it is characterized by preparing the standby condition lock section which regulates the variation rate of said swing unit before any 1 term of claims 1-5 is transferred by said disk selection section between disk magazines in the disk unit of a publication.

[0033] In the above invention according to claim 6, since the swing unit in a standby condition is stabilized and is held by the standby condition lock section, the shake by vibration is prevented and deformation of components and fear of breakage disappear.

[0034] Invention according to claim 7 is characterized by preparing the transfer condition lock section which regulates the variation rate of said swing unit transferred to any 1 term of claims 1-6 by said chassis unit between disk magazines in the disk unit of a publication.

[0035] In the above invention according to claim 7, since the transferred swing unit is stabilized and is held by the transfer condition lock section, while skipping by vibration stops occurring at the time of disk playback, deformation of components and fear of breakage disappear.

[0036] A vertical guide hole is formed at least in one side of said disk magazine divided in a disk unit given in any 1 term of claims 1-7, and invention according to claim 8 is characterized by preparing the guide shaft of the perpendicularly it inserts in said guide hole at the time of division of said disk magazine and coalesce in said chassis unit.

[0037] In the above invention according to claim 8, in case the magazine division section divides a disk magazine, the top-face section or the inferior-surface-of-tongue section of a disk magazine moves perpendicularly. A guide shaft inserts in the guide hole formed in the magazine which moves at this time. And in case a disk magazine is coalesced, since migration of a magazine is guided by the guide shaft inserted in the guide hole, a location gap is prevented and a malfunction does not arise by it.

[0038] The tray guide which invention according to claim 9 goes up and down with the divided disk magazine in said disk division section in a disk unit given in any 1 term of claims 1-8 is prepared, and it is characterized by said tray guide having the slit in which the edge of the tray in the disk magazine which goes up and down is inserted by the migration possible [ sliding ].

[0039] In the above invention according to claim 9, since the edge of a tray to go up and down is supported by the slit of a tray guide, a tray's hanging down is prevented.

[0040] Moreover, the tray equipped with a disk of two or more sheets is contained, and the disk magazine of this invention has the following technical features in the disk magazine which can be



divided into the top-face section and the inferior-surface-of-tongue section.

[0041] namely, invention according to claim 10 -- said tray -- the inside of said disk magazine -- a slide - it carries out that it is prepared movable and the tray supporter material which moves between the lock location which locks a coalesce condition while while is divided and being supported at a disk magazine side according to the migration, and the lock discharge locations which cancel the lock of a coalesce condition while being supported at the disk magazine side of another side divided to said tray is prepared as the description.

[0042] In the above invention according to claim 10, since a lock and lock discharge of a disk magazine are realizable with slide migration of a tray, the structure in a magazine can be simplified.

[0043] Invention according to claim 11 is characterized by preparing trace pulling which energizes said tray in the direction which regulates migration of said tray in a disk magazine according to claim 10 at either [ at least ] the top-face section of said disk magazine, or the inferior-surface-of-tongue section.

[0044] In the above invention according to claim 11, since slide migration of a tray is controlled by the energization force of trace pulling, the elutriation of the tray by vibration is prevented according to it.

[0045] Invention according to claim 12 is characterized by forming the vertical guide hole in a disk magazine according to claim 10 or 11 at either [ at least ] the top-face section of said disk magazine, or the inferior-surface-of-tongue section.

[0046] In the above invention according to claim 12, since migration of the magazine top-face section or the magazine inferior-surface-of-tongue section is guided by making a shaft etc. insert in a guide hole, division of a disk magazine and the location gap at the time of coalesce are prevented.

[0047] In a disk magazine given in any 1 term of claims 10-12, between [ two or more ] the disk maintenance location holding a disk and the disk release locations which release a disk are established in a movable disk attachment component by said tray in the periphery of a disk, and invention according to claim 13 is characterized by preparing said disk attachment component possible [ a synchronization ] by the single link member at it.

[0048] In the above invention according to claim 13, since it is realizable by driving a link member with single maintenance and release of a disk to the perimeter of a tray, the device for releasing the disk with which it was equipped on the turntable from a tray can be simplified.

[0049] Invention according to claim 14 is characterized by preparing the disk locking lever which makes said disk attachment component shift to any 1 term of claims 10-13 to a disk release location in the disk magazine of a publication movable by hand control.

[0050] In the above invention according to claim 14, since a disk attachment component can be evacuated from the perimeter of a disk by moving a disk locking lever manually, reservation of the disk maintenance to a disk magazine, insertion of a disk, and easy-ization of discharge can be reconciled.

[0051] Invention according to claim 15 is characterized by establishing between the regulation location which regulates slide migration of said tray at the migration edge of said disk locking lever, and the release locations which release said tray in the movable tray lock link in a disk magazine given in any 1 term of claims 10-14.

[0052] In the above invention according to claim 15, a tray lock link prevents the blank of a disk locking lever by being prepared in the migration edge of a disk locking lever while preventing the elutriation of a tray.

[0053] In the condition that said top-face section and said inferior-surface-of-tongue section coalesced in any 1 term of claims 1-15 in the disk magazine of a publication, invention according to claim 16 is characterized by vacating spacing for the periphery of said top-face section and said inferior-surface-of-tongue section, and forming the side attachment wall in it so that opening may be formed in the side face.

[0054] A small disk magazine can consist of above invention according to claim 16 by omitting a part of side attachment wall, and preparing opening.

[0055]

[Embodiment of the Invention] The gestalt of operation of this invention is explained below with reference to drawing 1 - drawing 42 .

[0056] [1. Configuration] of the gestalt of operation

1-1. The disk unit of the gestalt of whole configuration book operation is constituted by preparing two or more following units on the chassis unit 1 equipped with the case 100 of a disk magazine, as shown in drawing 1.

[0057] \*\* Divide the magazine case 100 up and down, and it is prepared on the up-and-down unit 300\*\* up-and-down unit 300 which chooses the disk D of the magazine shift unit 200\*\* purpose which secures a playback tooth space in the meantime. It is prepared on the swing unit 400\*\* swing unit 400 transferred to the playback tooth space of the divided magazine case 100. These configurations are explained in full detail below the magazine ejection unit 600 (refer to drawing 17) that discharges the drive unit 500\*\* magazine case 100 equipped with optical pickup.

[0058] 1-2. \*\*\*\* of a disk magazine -- explain the configuration of a disk magazine with reference to drawing 2 - drawing 7 first. In addition, let back and the lower part in drawing be the front for the upper part in drawing 3 - drawing 5. That is, as shown in drawing 2, it is divided on the tray 110 of five sheets which the interior holds Disk D according to an individual, and holds the magazine case 100 of a thin form. This magazine case 100 is formed in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 possible [division]. The configuration of each part is as follows.

[0059] \*\* As each tray 110 which divides the inside of the tray magazine case 100 is shown in drawing 3, it is the plate of an abbreviation square configuration and the radii-like radius of circle is formed in the angle corresponding to insertion opening (the drawing Nakaya mark shows) of Disk D. Near the back end of the right-hand side edge of this tray 110, the 1st tray support pawl 111 projected to the method of the right is formed. And near the front end of the right-hand side edge of a tray 110, the 2nd tray support pawl 112 projected to the method of the right is formed. Stop projection 112a is formed 2nd front and behind the tray support pawl 112. Furthermore, near the front end of the left-hand side edge of a tray 110, the 3rd tray support pawl 113 projected to the left is formed.

[0060] The 1st disk catch 114 and the 2nd disk catch 115 are formed in the corner corresponding to the 1st tray support pawl 111 in a tray 110. Disk attaching part 114a is prepared and, as for the 1st disk catch 114, is attached in the back end rotatable [the center section] on a tray 110. Pressed pawl 114b is formed in this 1st disk catch's 114 posterior part. The 1st disk catch's 114 front end is connected with the back end rotatable, the 2nd disk catch 115 is attached rotatable [the center section] on a tray 110, and disk attaching part 115a is prepared in the front end.

[0061] Furthermore, the 3rd disk catch 116 is formed near the corner corresponding to the 3rd tray support pawl 113 in a tray 110. Disk attaching part 116a is prepared and, as for this 3rd disk catch 116, is attached in that back end rotatable [that front end] on a tray 110.

[0062] These 1-3rd disk catches 114-116 are formed by the disk catch link 117 possible [linkage]. This disk catch link 117 is the plate of L typeface, and is attached rotatable centering on the corner of that L typeface near the corner corresponding to the 2nd tray support pawl 112 in a tray 110. It connects with the 1st and 2nd disk catches' 114,115 joining segment near the back end of the disk catch link 117 rotatable. Moreover, at a projection and its tip, as for the back end of the disk catch link 117, character section 117a of KO of the typeface of KO is formed in right-hand side for the cross section.

Furthermore, the front end of the disk catch link 117 is back energized with the catch spring 118 which is torsion coiled spring while it is connected rotatable near the 3rd disk catch's 116 back end.

[0063] since such a disk catch link 117 is energized with the catch spring 118 -- the 1- the 3rd disk catch 114-116 is energized in the direction in which the disk attaching parts 114a-116a press the edge of Disk D. In addition, rotation of the disk catch link 114 is regulated by regulation slot 117b formed in the tray 110 at the constant rate.

[0064] Moreover, slitting 110a is formed in the both ends of the circular section in a tray 110, and 110d of lobes of the shape of a small right triangle is formed in the trailing edge of the circular section. And radii-like notch 110b is formed near the corner corresponding to the 2nd tray support pawl 112 in a tray 110. Furthermore, near [three] corners other than the disk insertion opening side in a tray 110, disk guide 110c which contacts the periphery of Disk D is formed.

[0065] \*\* Explain the configuration of the magazine top-face section magazine top-face section 120

with reference to drawing 4 . namely, the magazine top-face section 120 -- the top-face plate 121 and the 1- it is constituted by the 3rd top slit section 122-124. The top-face plate 121 is the plate of an abbreviation square configuration, and the radii-like radius of circle is formed in the angle corresponding to insertion opening (the drawing Nakaya mark shows) of Disk D. Besides, slitting 121a is formed in the both ends of the circular section in a face-plate 121.

[0066] the 1- the 3rd top slit section 122-124 -- the 1- of a tray 110 -- it is formed corresponding to the 3rd tray support pawl 111-113. these the 1- it is shown in drawing 6 (A) at the 3rd top slit section 122-124 -- as -- the 1- of each tray 110 -- the slits 122a-124a in which the 3rd tray support pawl 111-113 is inserted, respectively are formed. The number of Slits 122a-124a is the number of sheets and the same number (the gestalt of this operation five) of a tray 110. The maximum upper case is formed for a long time among these slits 122a-124a compared with other stages.

[0067] moreover, the 1- in the top-face plate 121 -- near the 3rd top slit section 122-124, heights 121b projected caudad, respectively is formed. Moreover, behind the 2nd top slit section 123, the bottom trace pulling 125 which stop projection 112a of the right-hand side edge of a tray 110 contacts is formed. And the guide hole 126 which is a small round hole perpendicularly penetrated to the anterior part of the top-face plate 121 is formed in two right and left. Furthermore, the side attachment wall 127 is formed in the right-hand side edge in the top-face plate 121.

[0068] \*\* As shown in drawing 5 , the magazine inferior-surface-of-tongue section magazine inferior-surface-of-tongue section 130 is the same configuration as the top-face plate 121, and is constituted by the inferior-surface-of-tongue plate 131 which has slitting 131a. the inferior-surface-of-tongue plate 131 -- the 1- by the side of the magazine top-face section 120 -- the 1- which holds a tray 110 at the magazine inferior-surface-of-tongue section 130 side, respectively in the location corresponding to the 3rd top slit section 122-124 -- the 3rd bottom slit section 132-134 is formed. this the 1- it is shown [ 132 ] in drawing 6 (A) at the 3rd bottom slit section-134 -- as -- the 1- of each tray 110 -- same number formation of the slits 132a-134a in which the 3rd tray support pawl 111-113 is inserted is carried out with the number of sheets of a tray 110.

[0069] such the 1- the time of there being five slits 132a-134a of the 3rd bottom slit section 132-134 in the condition that the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 coalesced -- the 1- five steps of slits which continued horizontally with the slits 122a-124a of the 3rd top slit section 122-124 are constituted.

[0070] And crevice 131b three heights 121b of the top-face plate 121 carries out [ b ] fit, respectively is formed in the inferior-surface-of-tongue plate 131. Furthermore, rectangle-like hollow 131c is formed before back slitting 131a in the outsole side of the inferior-surface-of-tongue plate 131, and 131d of locked slots of L typeface is formed in the right of this slitting 131a.

[0071] Moreover, the disk discharge lever 135 is formed near the 2nd bottom slit section 133 in the inferior-surface-of-tongue plate 131. This disk discharge lever 135 is formed in the location corresponding to notch 110b in a tray 110 rotatable, and is energized in the direction contrary to the direction where that tip discharges Disk D by torsion coiled spring 135a. Furthermore, the bottom trace pulling 139 which contacts stop projection 112a of a tray 110 ahead of the 2nd bottom slit section 133 is formed.

[0072] And as shown in drawing 5 and drawing 7 , near the 1st bottom slit section 132 of the inferior-surface-of-tongue plate 131, the disk locking lever 136 and the tray lock link 137 are formed. The disk locking lever 136 is constituted by plate section 136a, press section 136b, and control unit 136c. the pin which 136d of slide holes of L typeface was formed in plate section 136a, and was fixed to the inferior-surface-of-tongue plate 131 side is inserted in 136d of this slide hole -- the disk locking lever 136 -- the shape of L character -- a slide -- it is prepared movable.

[0073] Control unit 136c started perpendicularly is prepared in the back end of plate section 136a. the rear face of this control unit 136c -- many -- the slot of several articles was formed and it has exposed from the posterior part of a magazine. And at the right end of control unit 136c, press section 136b projected ahead is prepared. The tip of press section 136b is established in the 1st disk catch's 114 pressed pawl 114b possible [ attachment and detachment ]. And since it is energized leftward in

drawing, in the condition that external force does not join control unit 136c, press section 136b contacts pressed pawl 114b, and, as for plate section 136a, rotation of the 1st disk catch 114 and the 2nd disk catch 115 is locked by torsion coiled spring 136e.

[0074] The tray lock link 137 is the plate prepared in the inferior-surface-of-tongue plate 131 rotatable, and the edge is established in the right rear edge of a tray 110 by the rotation possible [ engaging and releasing ] (refer to drawing 39 ). And this tray lock link 137 is energized rightward in drawing by torsion coiled spring 137a. Moreover, the tray lock link 137 has been arranged at the movable range edge of the disk locking lever 136, and has regulated migration to the right of the disk locking lever 136 in the fixed range. And the discharge pawl guide 138 to which the tray lock discharge pawl 4 (refer to drawing 39 ) formed in the chassis unit 1 side is inserted in the inferior-surface-of-tongue plate 131 is formed. Furthermore, side-attachment-wall 130a is prepared in right and left of the first transition in the inferior-surface-of-tongue plate 130, and the front end of a right-hand side edge.

[0075] 1-3. a magazine shift unit -- raise the magazine top-face section 120 of the above configurations, and explain the configuration of the magazine shift unit 200 which divides the magazine case 100 according to drawing 8 - drawing 16 . In addition, let the upper part of drawing 8 into back, and let a lower part be the front. This magazine shift unit 200 is constituted by the magazine electrode holder 210, the cylindrical cam 220, the synchro gear 230, and the magazine shift plate 240 grade. The configuration of each part is as follows.

[0076] \*\* It is the member crooked in cross-section horseshoe-shaped in the plate, and the top face is formed in the almost same configuration as the magazine top-face section 121 so that the magazine electrode-holder magazine electrode holder 210 may cover the top-face plate 121 and both its side of the magazine top-face section 120, as shown in drawing 8 -10. this magazine electrode holder 210 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable.

[0077] The frame-like magazine insertion opening 2 is formed in the anterior part of the chassis unit 1 so that the front end of the magazine electrode holder 210 may be surrounded. One guide shaft 3 projected perpendicularly is being caudad fixed to the head-lining side of this magazine insertion opening 2 at a time by right and left. And when the magazine electrode holder 210 moves up and down, two insertion hole 210a which the two above-mentioned guide shafts 3 insert in by non-contact, respectively is formed in the top face of the magazine electrode holder 210. In addition, the guide shaft 3 and insertion hole 210a are prepared in the location corresponding to the guide hole 126 of the magazine top-face section 120 with which it was completely equipped in the magazine electrode holder 210. Moreover, inside the side face of right and left of the magazine electrode holder 210, bottom grasping pawl 210b which grasps the inserted top-face plate 121 of the magazine top-face section 120 is prepared.

[0078] On the other hand, bottom grasping pawl 2a which grasps the inserted inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 is prepared in the medial surface of right and left of the magazine insertion opening 2 in the chassis unit 1. In addition, return section 210c opened outside and 2b are formed in the front end of the magazine electrode holder 210 with which the magazine case 100 is inserted, and the front end of the base of the magazine insertion opening 2.

[0079] And as shown in drawing 11 and drawing 12 , two electrode-holder guide pins 211 are formed in the right lateral of the magazine electrode holder 210. right-hand side electrode-holder guide slot 1a by which two trains of these two electrode-holder guide pins 211 were formed perpendicularly at the right lateral of the chassis unit 1 -- a slide -- it is inserted in movable.

[0080] On the other hand, as shown in drawing 13 and drawing 14 , one electrode-holder guide pin 211 is formed in the left lateral of the magazine electrode holder 210. left-hand side electrode-holder guide slot 2c by which one train of this one electrode-holder guide pin 211 was formed perpendicularly at the magazine insertion opening 2 -- a slide -- it is inserted in movable.

[0081] Moreover, the cloth plate 213 of two sheets by which crossover arrangement was carried out is formed in the shape of an X character at the left lateral of the magazine electrode holder 210. That core is connected rotatable mutually and, as for this cloth plate 213, each upper limit is attached in the left lateral upper part of the magazine insertion opening 2 rotatable. Moreover, each lower limit of a cloth plate 213 is attached in the left lateral of the magazine electrode holder 210 rotatable. the edge behind

[ each ] the cloth plate 213 of these two sheets -- the left lateral of the magazine insertion opening 2 and the magazine electrode holder 210 -- a constant-rate slide -- it is prepared movable. For this reason, the cloth plate 213 has composition expanded and contracted in the height direction according to vertical movement of the magazine electrode holder 210, as shown in drawing 14 .

[0082] Furthermore, as shown in drawing 13 and drawing 14 , the tray guide 212 is formed in the posterior part of the magazine electrode holder 210. This tray guide 212 is the member of the perpendicularly slit 212a of the shape of a ctenidium corresponding to the number of trays 110 was formed. It has the composition that 110d of lobes of each tray 110 which moved goes into each slit 212a.

[0083] \*\* The cylindrical-cam cylindrical cam 220 is formed in the left side of the magazine insertion opening 2 in the chassis unit 1 rotatable centering on the vertical shaft, as shown in drawing 8 - drawing 10 . Spiral cam 220a is formed in the perimeter of a cylindrical cam 220, and the electrode-holder guide pin 211 of the magazine electrode holder 210 is engaging with this spiral cam 220a. Moreover, Ohira gearing 220b is formed in the perimeter of the lower part of a cylindrical cam 220. This Ohira gearing 220b is engaging with transfer gear 221a which tells the driving force of the magazine shift motor 221 attached in the chassis unit 1. Furthermore, disc-like gear 220c which is the Kodaira gearing is formed in the lowest edge of a cylindrical cam 220.

[0084] \*\* The synchro gear synchro gear 230 is constituted by the 1st disk section 231 and the 2nd disk section 232 which were prepared in the outsole side of the chassis unit 1 as shown in drawing 8 . The 1st disk section 231 and the 2nd disk section 232 adjoin right and left, and are arranged, and the core is established in them rotatable as a shaft, respectively. While circular gear 231a which engages with disc-like gear 220c of a cylindrical cam 220 is formed in the 1st disk section 231, circular gear 231b is formed in the location which counters this circular gear 231a.

[0085] While circular gear 232a which engages with circular gear 231b of the 1st disk section 231 is formed in the 2nd disk section 232, circular gear 232b is formed in the location which counters this circular gear 232a. In addition, the amount of rotation is regulated so that engagement of the circular gears 231b and 232a may not separate from the 1st disk section 231 and the 2nd disk section 232.

[0086] \*\* it is shown in the right lateral of the magazine SHIFUTOPURETO chassis unit 1 at drawing 8 , drawing 15 , and drawing 16 -- as -- the magazine shift plate 240 -- order -- a slide -- it is prepared movable. That horizontal plane is established along the base of the chassis unit 1, and, as for this magazine shift plate 240, the rack 241 for a magazine shift is formed in the left-hand side edge of this horizontal plane. And the rack 241 for a magazine shift is engaging with circular gear 232b in the 2nd disk section 232.

[0087] Moreover, the right-hand side of the magazine shift plate 240 serves as a vertical plane started in accordance with the right lateral of the chassis unit 1. As shown in drawing 16 , two inclination cam dies 242 which inclined from the front so that it might become low according to back are mutually formed in this vertical plane in parallel. and -- this inclination cam die 242 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable. Furthermore, the right floating lock pawl 243 projected at a level with the method of the right is formed in the vertical plane of the magazine shift plate 240.

[0088] 1-4. In order to choose the disk D which carries out up-and-down unit playback, explain the configuration of the up-and-down unit 300 which determines the division location of the magazine case 100 according to drawing 17 - drawing 30 . In addition, let the upper part of drawing 17 into back, and let a lower part be the front. This up-and-down unit 300 is constituted by the loading gear 310, the post-shift plate 320, the link plate 330, the left shift plate 340, the up-and-down chassis 350, and the drive unit 360 grade. The configuration of each part is as follows.

[0089] \*\* The loading gear loading gear 310 is formed in the method of the left rear of the base of the chassis unit 1, as shown in drawing 17 . This loading gear 310 is a spur gear, and the driving force of the loading motor 311 attached in the chassis unit 1 has composition transmitted through transfer gear group 311a.

[0090] \*\* it is shown in the back side face in the back shift plate chassis unit 1 at drawing 17 - drawing

19 -- as -- the post-shift plate 320 -- right and left -- a slide -- it is prepared movable. After this, that horizontal plane is established along the base of the chassis unit 1, and, as for the shift plate 320, the rack 321 for an up-and-down shift is formed in the first transition of this horizontal plane. And the rack 321 for an up-and-down shift is located in the height which engages and releases lower-berth gear 310c of the loading gear 310 according to slide migration of the post-shift plate 320.

[0091] Moreover, the post-shift plate 320 serves as a vertical plane started along the rear face of the chassis unit 1. As shown in drawing 18 and drawing 19, the posterior part stair-like cam 322 of one articles which becomes low according to the right (from the right to the left [ Seeing from a transverse-plane side. ]) is formed in this vertical plane from the left.

[0092] \*\* As the link plate link plate 330 is shown in drawing 17, it is a sector member and the top-most-vertices section 331 is attached in the outsole side of the chassis unit 1 rotatable. Moreover, the right end section of the radii part of the link plate 330 is connected with the left end section of the horizontal plane of the post-shift plate 320 rotatable. Furthermore, near the pars intermedia of the radii part of the link plate 330, after projecting horizontally back, the floating lock pawl 332 is formed.

[0093] \*\* the left shift plate left shift plate 340 is shown in drawing 17, drawing 20, and drawing 21 -- as -- the left side face of the chassis unit 1 -- order -- a slide -- it is prepared movable. That horizontal plane is established along the base of the chassis unit 1, and, as for this left shift plate 340, the left end section of the radii part of the link plate 330 is connected with the back end of this horizontal plane rotatable.

[0094] Moreover, the left-hand side of the left shift plate 340 serves as a vertical plane started along the rear face of the chassis unit 1. As shown in drawing 20 and drawing 21, the left part stair-like cam 341 of two articles which becomes low according to the front is formed in this vertical plane from back. Furthermore, the left floating lock pawl 343 projected at a level with a left is formed in the vertical plane of the left shift plate 340.

[0095] \*\* The up-and-down chassis up-and-down chassis 350 is the plate of the horizontal plane of an abbreviation L typeface over the left part from the back side of the chassis unit 1, as shown in drawing 17. the configurations with this following up-and-down chassis 350 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable. That is, as shown in drawing 18, the vertical plane along the back side face of the chassis unit 1 is formed in the posterior part of the up-and-down chassis 350, and one up-and-down guide pin 351 is formed in this vertical plane. this up-and-down guide pin 351 -- the posterior part stair-like cam 322 of the post-shift plate 320 -- a slide -- it is inserted in movable.

[0096] Moreover, as shown in drawing 20, two up-and-down guide pins 351 are formed in the left part of the up-and-down chassis 350. this up-and-down guide pin 351 -- the left part stair-like cam 341 of the left shift plate 340 -- respectively -- a slide -- it is inserted in movable.

[0097] \*\* On the above drive unit up-and-down chassis 350, as shown in drawing 22, the drive unit 360 to which a tray 110 is moved is formed. This drive unit 360 is constituted by a drive motor 361, the A gear - I gears 362a-362i, the Maine rack 363, the 1st cam gear 364, the 2nd cam gear 365, the tray slide link 366, the trace rider 367, and the disk catch lever base 368 grade.

[0098] The A gear - E gears 362a-362e are two or more gears which transmit the driving force of a drive motor 361 to the Maine rack 363, as shown in drawing 22 - drawing 25. the Maine rack 363 -- right and left -- a slide -- it is the member prepared movable, and as shown in drawing 25, continuation rack section 363b which followed intermittent rack section 363a which has an intermission in the middle is prepared in the duplex. And F gear 362f is prepared in intermittent rack section 363a possible [ engaging and releasing ], and continuation rack section 362b is engaging with E gear 362e. Upheaval marginal 363c of the shape of a straight line parallel to intermittent rack section 363a and continuation rack section 363b is prepared in this Maine rack 363. Furthermore, 363d of straight-line-like cave-in edges is formed in the pars intermedia of upheaval marginal 363c. And rotation of F gear 362f has composition transmitted to the 1st cam gear 364 and the 2nd cam gear 365 through G gear 362 g-I gear 362i.

[0099] As the 1st cam gear 364 is shown in drawing 26 (A) - (D) and drawing 27 (E) - (H), it is a disc-like spur gear, and top tray slide cam-groove 364a is formed in the top face, and bottom tray slide cam-

groove 364b is formed in the inferior surface of tongue. Top tray slide cam-groove 364a is the cam groove in which the narrow diameter portion of a semicircle and the major diameter of a semicircle were formed continuously. Bottom tray slide cam-groove 360b is the cam groove in which the induction prepared in the periphery edge, the pars intermedia extended at the periphery side which counters [ near central ], and the radii section of a minor diameter were formed continuously.

[0100] The tray slide link 366 is formed such near the 1st cam gear 364. As for the tray slide link 366, the back end is horizontally attached in the up-and-down chassis 350 rotatable. Near the back end of this tray slide link 366, pin 366a inserted in top tray slide cam-groove 364a of the 1st cam gear 364 is prepared.

[0101] moreover -- the tray slide link 366 -- the trace rider 367 -- a slide -- it is prepared movable. Between this trace rider 367 and the tray slide link 366, as shown in drawing 30 (I) - (L), the extension spring 369 is attached. And near the back end of the trace rider 367, pin 367a inserted in bottom tray slide cam-groove 364b of the 1st cam gear 364 is prepared. Furthermore, horseshoe-shaped grasping section 367b which engages and releases the 1st tray support pawl 111 of a tray 110 is prepared in the front end of the trace rider 367.

[0102] On the other hand, the 2nd cam gear 365 is the disc-like spur gear formed in the 1st cam gear 364 and same axle rotatable, as shown in drawing 22. As shown in drawing 28 (A) - (D) and drawing 29 (E) - (H), disk catch cam-groove 365a is formed in the top face of this 2nd cam gear 365. This disk catch cam-groove 365a is the cam groove in which the narrow diameter portion of the shape of radii near a core and the major diameter of the shape of radii near a rim were formed continuously.

[0103] The disk catch lever base 368 is formed such near the 2nd cam gear 365. This disk catch lever base 368 is established in the tray slide link 366 and the same axle rotatable [ that back end ] on the up-and-down chassis 350. Near the back end of this disk catch lever base 368, pin 368a inserted in disk catch cam-groove 365a of the 2nd cam gear 365 is prepared. Moreover, the disk catch lever base 368 is formed possible [ vertical movement ] in accordance with the rotation shaft, and is caudad energized by compression coil spring 368b.

[0104] Furthermore, as shown in drawing 30 (I) - (L), the back end of the disk catch lever 370 is prepared in the disk catch lever base 368 rotatable up and down. This disk catch lever 370 is held by torsion coiled spring 370a so that that include angle may be located on the same horizontal plane as the disk catch lever base 368. Furthermore, press pawl 370b which presses character section 117a of KO of the disk catch link 117 is prepared at the tip of the disk catch lever 370.

[0105] 1-5. Explain the swing unit 400 transferred between the magazine cases 100 by which swing unit division was carried out according to drawing 22, drawing 31 - drawing 34. In addition, let the upper part of drawing 22 into back, and let a lower part be the front. This swing unit 400 is constituted by the transfer drive 410 and the swing chassis 420 grade. The configuration of each part is as follows.

[0106] \*\* The transfer drive transfer drive 410 is constituted by the power plate 411, the power rack 412, J gear 362j, the spring member 413, the 1st gear lock link 414, and the 2nd gear lock link 415 as shown in drawing 31 (A), (B) and drawing 32 (C), and (D). the power plate 411 is shown in drawing 22 -- as -- the up-and-down chassis 350 -- right and left -- a slide -- it is the plate of the shape of an abbreviation rectangle established movable. Guide hole 411a which is the slot of a cross direction is formed in the left end section of this power plate 411.

[0107] moreover, the back of the power plate [ in / in the power rack 412 / the up-and-down chassis 350 ] 411 -- right and left -- a slide -- it is prepared movable. Rack section 412a of this power rack 412 is prepared in J gear 362j which rotation of C gear 362c is delivered possible [ engaging and releasing ]. Furthermore, upheaval marginal 412b parallel to rack section 412a is formed in the pars intermedia of the power rack 412.

[0108] The 1st gear lock link 414 is an abbreviation triangle-like plate, and it has become rotation shaft 414a attached in the up-and-down chassis 350 rotatable near [ the ] the right top-most-vertices section. Near the top-most-vertices section of the method of the forward left in the 1st gear lock link 414, front contact cylinder 414b which contacts upheaval marginal 363c of the Maine rack 363 is prepared. Moreover, near the top-most-vertices section of the method of the left rear in the 1st gear lock link 414,



back contact cylinder 414c which contacts the first transition of the 2nd gear lock link 415 is prepared. [0109] The 2nd gear lock link 415 is the member which prepared the extension in the right end of a rectangle-like plate, and the edge of an extension has become rotation shaft 415a attached in the up-and-down chassis 350 rotatable. Lock cylinder 415b which contacts upheaval marginal 412a of the power rack 412 is prepared in the method corner of the left rear of the quadrature part in the 2nd gear lock link 415.

[0110] The spring member 413 is a member which the both ends of a metal wire were set [ member ] to bay 413a, and incurvated middle in the circle configuration. As for this spring member 413, the top-most vertices of that bend are supported by the power plate 411. Moreover, although specification-part 412c projects and is prepared near the pars intermedia of the power rack 412, this specification-part 412c is located between two bays 413a of the spring member 413 so that it may energize in contact with two either of the bay 413a according to slide migration of the power rack 412. In addition, when no energization force has also joined two bays 413a, the elastic force of the spring member 413 is set up so that bay 413a may become parallel mutually.

[0111] \*\* The swing chassis swing chassis 420 is the plate of the abbreviation shuttle-race-back configuration established on the up-and-down chassis 350, as shown in drawing 22 . This swing chassis 420 is formed rotatable centering on the transfer rotation shaft 421 established near that right end section. and -- the right end section of the swing chassis 420 -- guide hole 411a of the power plate 411 -- a slide -- the connection pin 422 inserted in movable is formed. Moreover, the guide pin 423 is formed near the back end of the swing chassis 420. the radii-like transfer rotation guide hole 352,353 where these connection pins 422 and guide pins 423 were formed in the up-and-down chassis 350 -- a slide -- it is inserted in movable. Furthermore, left contact pawl 424a is formed in \*\*\*\*\* of the swing chassis 420, and right contact pawl 424b is formed in the front end section.

[0112] On the other hand, as shown in drawing 20 and drawing 21 , when the swing chassis 420 transfers the left shift plate 340 and it is before rotation, the slit 342 for a lock with which left contact pawl 424a engages is formed. Moreover, as shown in drawing 11 and drawing 12 , when the swing chassis 420 is transferred, the V character slit 6 with which right contact section 424b engages is formed in the right lateral of the chassis unit 1. Corresponding to change of the height of the swing chassis 420, two or more steps of this V character slit 6 are formed. And after the swing chassis 420 engages with the V character slit 6, the hole 244 for a lock is established in the magazine shift plate 240 so that the swing chassis 420 may be locked. Furthermore, as shown in drawing 22 , the stopper 354 with which the swing chassis 424 transfers and the after [ the swing chassis 424 ] left end section contacts before rotation is formed in the up-and-down chassis 350.

[0113] 1-6. Explain the drive unit 500 which plays the disk D by which drive unit selection was made according to drawing 33 (A) - (C). This drive unit 500 is constituted by a turntable 520, the release device 510, the optical pickup 530, and delivery device 540 grade. The configuration of each part is as follows.

[0114] \*\* The turntable 520 is attached on the turntable swing chassis 420. This turntable 520 is formed pivotable by the spindle motor 521. As shown in drawing 34 (A) - (C), the sleeve 522 which is the barrel of a bobbin configuration is formed in the perimeter of the revolving shaft of a turntable 520 movable up and down. Although this sleeve 522 is energized up with the spring 523, since the top face of a sleeve 522 is regulated by pin center, large stopper 522a, vertical movement of a sleeve 522 is restricted to the constant rate. The disk insertion section 524 of the shape of a ring inserted in the hole of the center of Disk D is formed in the perimeter of the sleeve 522 in a turntable 520.

[0115] Inside the disk insertion section 524, the disk hook 525 which moors to the hole of the inserted-in disk D and is held is formed at intervals of [ equal ] three. Mooring section 525a which upheaved so that it might moor to the hole of Disk D is formed in the upper limit outside of the disk hook 525. That lower limit section outside is established in this disk hook 525 rotatable as supporting-point 525b. Furthermore, since the top-face edge of a sleeve 522 is in contact with the inferior surface of tongue of the inside edge of the disk hook 525 from the lower part, the disk hook 525 is energized with the spring 523 so that the mooring section 525a may open outside.



[0116] \*\* The release device release device 510 is a device in which chucking of the disk D on the above turntables 520 is canceled. namely, -- the swing chassis 424 top -- a turntable 520 -- caudad -- the release plate 511 -- horizontal -- a slide -- it is prepared movable. Release edge 511a which contacts the inclination side face of the sleeve 522 bottom from the optical pickup 530 side is prepared in this release plate 511. Moreover, since the end is attached in the other end of the extension spring 512 fixed to about 530 optical pickup on the swing chassis 424, the release plate 511 is energized at the optical pickup 530 side.

[0117] \*\* As shown in optical pickup, delivery device, and drawing 33 (A) - (C), on the swing chassis 420, the optical pickup 530 and its delivery device 540 are carried. The optical pickup 530 is the head equipped with the lens 531 grade for reading to optical the information recorded on Disk D. The delivery device 540 is a device in which the slide migration of the optical pickup 530 is made to carry out in the direction of a path of the disk D on a turntable 520. namely, the guide rail 541 and feed screw 542 which have been arranged in parallel mutually -- the optical pickup 530 -- a slide -- it is prepared movable. And the feed screw 542 has pivotable composition by the delivery motor 543.

[0118] Furthermore, near the turntable 520 in the optical pickup 530, the inner circumference pilot switch which detects the most-inner-circumference signal reading station of a disk was prepared, and the switch knob 532 has projected. This switch knob 532 is formed possible [ detection of the disk most inner circumference ] by attaching and detaching to the switch spring 533 prepared on the swing chassis 420 according to migration of the optical pickup 530. In addition, the optical pickup 530 is formed further movable in the direction of disk inner circumference, and the switch spring 533 is formed possible [ elastic deformation ] according to this. Moreover, according to the migration, as for the optical pickup 530, the side face by the side of the turntable 520 is established possible [ attachment and detachment ] to the release plate 511.

[0119] 1-7. Explain the magazine ejection unit 600 for discharging the magazine ejection unit magazine case 100 from the chassis unit 1 below according to drawing 17 and drawing 35 . In addition, let the upper part of drawing 17 into back, and let a lower part be the front. This magazine ejection unit 600 is constituted by a loading plate 610, the loading arm 620, the extrusion member 630, the Power Lok link 640, and the magazine lock 650. The configuration of each part is as follows.

[0120] \*\* the loading plate loading plate 610 is shown in drawing 35 -- as -- the outsole side of the chassis unit 1 -- right and left -- a slide -- it is the plate prepared movable. The small rack 611 which engages with the loading gear 310 is formed in the trailing edge of a loading plate 610. And the Power Lok guide 615 which is the guide hole of a horizontal L typeface is formed in the posterior part of a loading plate 610. Moreover, the clipping section 612 is formed in the anterior part of a loading plate 610. This clipping section 612 is ramp 612b toward which the right half part inclined in horizontal level 612a of a longitudinal direction, and the left half inclined ahead. Furthermore, the hook 613 is formed in the first transition of a loading plate 610.

[0121] \*\* The loading-arm loading arm 620 is attached in the location which laps with the loading plate 610 in the outsole side of the chassis unit 1 rotatable centering on the rotation shaft 621, as shown in drawing 17 . The heights 622 which engaged with the clipping section 612 of a loading plate 610 are formed in the left end section of this loading arm 620. The hook 623 is formed near the rotation shaft 621 in a loading arm 620. The both ends of an extension spring 614 are being engaged between the hook 613 of a loading plate 610, and the hook 623 of a loading arm 620. And the right end of a loading arm 620 is connected with the back end of the extrusion member 630 rotatable.

[0122] \*\* the extrusion member extrusion member 630 -- the chassis unit 1 -- order -- a slide -- it is prepared movable. When the magazine case 100 is inserted, the catch section 631 which engages with hollow 131c of the inferior-surface-of-tongue plate 131 is formed in the front end section of this knockout member 630.

[0123] \*\* As shown in drawing 17 and drawing 35 , the Power Lok link 640 which transmits slide migration of a loading plate 610 to the post-shift plate 320 is established in the Power Lok link pan. This Power Lok link 640 is the plate of the shape of a typeface of \*\*, it is prepared in the left rear section of the base of the chassis unit 1 rotatable centering on the rotation shaft 643, and the guide pin 644 of that

back end is connected with the post-shift plate 320 rotatable. A guide pin 641 is formed in the middle corner of the Power Lok link 640, and this guide pin 641 is inserted in the Power Lok guide 615 of a loading plate 610. Furthermore, the left end of the torsion coiled spring 642 is connected with the right end of the Power Lok link 640 rotatable, and the right end of this torsion coiled spring 642 is attached in it rotatable on the base of the chassis unit 1.

[0124] \*\* It is the plate of the typeface to the magazine lock magazine lock 650, and is prepared in the right rear section of the base of the chassis unit 1 rotatable centering on the rotation shaft 651. The lock projection 652 which engages and releases 131d of locked slots of the inferior-surface-of-tongue plate 131 is formed in the front end of this magazine lock 650. Moreover, a guide pin 653 is formed in the back end of the magazine lock 650, and this guide pin 653 is inserted in the lock guide hole 323 formed in the horizontal plane of the rack 321 for an up-and-down shift. In addition, the lock guide hole 323 is a guide hole on a straight line on either side, and the left end section has shifted ahead.

[0125] 1-8. a floating lock device -- make the chassis unit 1 equipped with the above devices into floating by absorber support at the time of playback Of Disk D, and explain the floating lock device made into a floating lock condition at the time of standby. That is, as shown in drawing 1, the chassis unit 1 is held in the case unit 10 which is a larger case than this. Every one damper 11 is fixed to Hidari's medial surface in this case unit 10 forward and backward, and one damper 11 is being fixed to the right medial surface in the center. As for the chassis unit 1, floating support of the perimeter is carried out by these absorbers 11.

[0126] Moreover, the left floating lock plate 12, the right floating lock plate 13, and the post-floating lock plate 14 which upheaved inside are prepared in right and left of the case unit 10, and a back medial surface. Left lock slit 12a, right lock slit 13a, and post-lock slit 14a are formed in these floating lock plates, respectively.

[0127] On the other hand, the left floating lock pawl 343, the right floating lock pawl 243, and the post-floating lock pawl 332 which engage and release left lock slit 12a, right lock slit 13a, and post-lock slit 14a, respectively are formed in the left shift plate 340, the magazine shift plate 240, and the link plate 330 which were prepared in the chassis unit 1 side.

[0128] Moreover, left side plate 12b and right side plate 13b which the left floating lock pawl 343 and the right floating lock pawl 243 which engaged with left lock slit 12a and right lock slit 13a contact are prepared in the medial surface of the case unit 10. Furthermore, between the four corners of the chassis unit 1, and the four corners of the case unit 10, the damper spring 15 which is an extension spring, respectively is formed.

[0129] In addition, although illustration is not carried out, the switch and sensors for switching starting of the magazine shift motor 221, the loading motor 311, a drive motor 361, a spindle motor 521, and delivery motor 543 grade are arranged as follows at the chassis unit 1.

[0130] That is, the loading start switch which detects the inserted magazine case 100 having drawn and having come to the starting position, and the ejection and the switch which detect the completion of discharge of the magazine case 100 are formed in the chassis unit 1 by contacting the edge of a loading arm 620.

[0131] Moreover, the height of the magazine electrode holder 210 is set as the three-stage of a magazine insertion discharge location (the minimum location), a disk chucking location (mid-position), and a magazine open position (the highest location). And corresponding to the location of these magazine electrode holders 210, the magazine closing switch which detects the minimum location, the chucking switch which detects the mid-position, and the magazine opening switch which detects the highest location are formed in the chassis unit 1 so that it may become detectable about each location of the magazine shift plate 240. Furthermore, the photosensor which detects rise and fall of the up-and-down chassis 350 is formed in the chassis unit 1.

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[Translation done.]

**\* NOTICES \***

**JPO and NCIPi are not responsible for any damages caused by the use of this translation.**

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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**OPERATION**

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[-- 2. -- operation] of the gestalt of operation -- the outline of the above actuation of the gestalt of this operation is as following A-M.

[0133] [A] If a user inserts the magazine case 100 from the magazine insertion opening 2 of the chassis unit 1, the magazine case 100 will be drawn by the magazine ejection unit 600 in the chassis unit 1 (magazine loading actuation).

[0134] [B] By the up-and-down unit 300, raise the up-and-down chassis 350 and choose the division location of the magazine case 100 (disk selection actuation).

[0135] [C] By the trace rider 367 of the drive unit 360, move a tray 110 and cancel the lock of the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (magazine lock discharge actuation).

[0136] [D] By the magazine shift unit 200, the magazine electrode holder 210 is raised, raise the magazine top-face section 120, divide the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 up and down, and secure the transfer tooth space of the swing unit 400 (magazine division actuation).

[0137] [E] Transfer the swing chassis 420 by the swing unit 400 between the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (swing unit transfer actuation).

[0138] [F] Drop the magazine electrode holder 210 by the magazine shift unit 200, and set the disk D held at the tray 110 of the bottom in the magazine top-face section 120 on a turntable 520 (disk chucking actuation).

[0139] [G] By the magazine shift unit 200, raise the magazine electrode holder 210 and secure the playback tooth space of Disk D (magazine evacuation actuation).

[0140] [H] Play the disk D on a turntable 520 by the optical pickup 530 (disk playback actuation).

[0141] After dropping the magazine electrode holder 210 by [I] magazine shift unit 200 and holding the disk D on a turntable 520 on a tray 110 again, the magazine electrode holder 210 is raised and a tray 110 is released from on a turntable 520 (disk re-receipt actuation).

[0142] [J] Shake out the swing chassis 420 by the swing unit 400 from between the magazine top-face section 120 and the magazine inferior-surface-of-tongue sections 130 (swing unit start actuation).

[0143] [K] Drop the magazine electrode holder 210 and make the magazine top face 120 and the magazine inferior-surface-of-tongue section 130 coalesce by the magazine shift unit 200 (magazine coalesce actuation).

[0144] [L] Drop the up-and-down chassis 350 and return to an initial valve position (up-and-down chassis downward actuation).

[0145] [M] Discharge the magazine case 100 from the magazine insertion opening 2 by the magazine ejection unit 600 (disk discharge actuation).

[0146] Hereafter, these actuation is explained in full detail. In addition, although the following explanation explains the example of operation at the time of choosing the disk D in the 3rd step of tray 110 in a disk magazine, the tray 110 of other stages can also be freely chosen by adjusting the location of the stair-like cam 322,341 and changing the rise-and-fall location of the up-and-down unit 300

according to a disk selection command.

[0147] 2-1. The magazine case 100 with which the magazine insertion actuation \*\* magazine coalesce condition chassis unit 1 is equipped is in the lock condition that division with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 was regulated, as shown in drawing 36. That is, as the top slit sections 122a-124a of the maximum upper case are shown in drawing 6 (A), it is formed for a long time than other stages, and the tray support pawls 111-113 of the maximum upper case inserted in this are formed for a long time than other stages.

[0148] The condition since it has this composition, before moving a tray 110, namely, in the condition that the tray support pawls 111-113 of all stages have visited the direction of the bottom slit sections 132a-134a Only the tray support pawls 111-113 of the maximum upper case were located ranging over the boundary of the top slit sections 122a-124a and the bottom slit sections 132a-134a, and the tray support pawls 111-113 of the lower berth are completely contained in the bottom slit section 132a - 134a side.

[0149] Thus, since it is regulated that both the slit sections 122a-124a, and 132a-134a shift in the vertical direction by straddling the boundary of the top slit sections 122a-124a and the bottom slit sections 132a-134a, the tray support pawls 111-113 of the maximum upper case are in the lock condition which the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 cannot divide up and down.

[0150] Moreover, the edge of the tray lock link 137 is engaging with the right rear edge of each tray 110. And the bottom trace pulling 125 and the bottom trace pulling 139 are in contact with stop projection 112a of each tray 110. Therefore, the migration is regulated and, as for the tray 110, the lock condition is held.

[0151] into this magazine case 100, Disk D inserts corresponding to each tray 110 -- having -- each disk D -- the 1- since it is held by the 3rd disk catch's 114-116 disk attaching parts 114a-116, the elutriation of Disk D is prevented.

[0152] The more concrete insertion of Disk D is as follows. That is, the slide migration of the disk locking lever 136 is made to carry out rightward by moving control unit 136c with a finger, as shown in drawing 7 (B). When this disk locking lever 136 contacts the edge of the tray lock link 137, that movement magnitude is regulated. Then, since it moves in the direction which pressed pawl 114b to the 1st disk catch's 114 press section 136b leaves, the rotation lock of the 1st disk catch 114 and the 2nd disk catch 115 is canceled.

[0153] in this condition, when Disk D is inserted, it is shown in drawing 37 -- as -- the 1- it is equipped with Disk D, while the 3rd disk catch 114-116 rotates so that those disk attaching parts 114a-116a may be pushed on the edge of Disk D and may evacuate.

[0154] And if a hand is lifted from the disk locking lever 136, the disk locking lever 136 will return leftward according to the energization force of torsion coiled spring 136e. Then, since the 1st disk catch's 114 pressed pawl 114b presses press section 136b, rotation of the 1st disk catch 114 and the 2nd disk catch 115 is locked. Therefore, the edge of Disk D is held by the disk attaching parts 114a-116a, and the elutriation of Disk D is prevented.

[0155] \*\* As the initial state which is not inserting the magazine case 100 shows initial-state one side and a disk unit to drawing 17, the extrusion member 630 is ahead and the small rack 611 of a loading plate 610 has geared with the loading gear 310. Moreover, the rack 321 for an up-and-down shift of the post-shift plate 320 is in the right-hand side of the loading gear 310, and is in the condition of not being engaged.

[0156] In addition, at the time of insertion and discharge of the magazine case 100, since the chassis unit 1 is in a floating lock condition and it is positioned by the case unit 10, insertion and discharge become easy.

[0157] \*\* in the condition of \*\*\*\*\* of a magazine case, as shown in drawing 17, when the magazine case 100 was inserted from the magazine insertion opening 2 of the chassis unit 1 towards the corner of the shape of the radii serving as a method of the left rear, the catch section 631 of the extrusion member 630 was formed in the inferior-surface-of-tongue plate 131 -- become depressed and engage with 131c.

Moreover, as shown in drawing 9 , the edge of right and left of the magazine top-face section 120 is inserted between the magazine electrode holder 210 and its bottom grasping pawl 210b, and the edge of right and left of the magazine inferior-surface-of-tongue section 130 is inserted between the chassis unit 1 and bottom grasping pawl 2a.

[0158] \*\* If the magazine case 100 is back stuffed into a loading initiation pan, since the extrusion member 620 will carry out slide migration in back and will press the left end of a loading arm 620 back, a loading arm 620 rotates counterclockwise. Then, since the edge of a loading arm 620 presses the loading start switch which is not illustrated, the loading motor 311 starts. The driving force of the loading motor 311 is transmitted through transfer gear group 311a, and the loading gear 310 rotates it counterclockwise.

[0159] As mentioned above, since the loading gear 310 is engaging with the small rack 611 of a loading plate 610, a loading plate 610 carries out slide migration of it rightward by rotation of the counterclockwise rotation of the loading gear 310. Then, since the heights 622 of a loading arm 620 move to ramp 612a of the clipping section 612 of a loading plate 610 as shown in drawing 38 , a loading arm 620 rotates counterclockwise further and moves the extrusion member 630 back. Therefore, the catch section 631 which engaged with hollow 131c draws the magazine case 100 back further.

[0160] Moreover, if a loading plate 610 carries out slide migration rightward, the guide pin 641 of the Power Lok link 640 will be energized rightward in contact with the left end of the Power Lok guide 615. Then, the Power Lok link 640 rotates counterclockwise, and the post-shift plate 320 is energized leftward by the energization force of the torsion coiled spring 642, and carries out slide migration according to it.

[0161] On the other hand, the magazine lock 650 has the guide pin 653 in the left end section of the lock guide hole 323 at the time of un-inserting the magazine case 100. In this condition, if the magazine case 100 is inserted as mentioned above, the lock projection 652 will be inserted in 131d of locked slots formed in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130. And since a guide pin 653 will move from the left end section of the lock guide hole 323 as shown in drawing 36 if the post-shift plate 320 carries out slide migration leftward as mentioned above, the magazine lock 650 rotates slightly counterclockwise and the lock projection 652 goes into the front end of 131d of locked slots.

[0162] \*\* rotation of a tray lock link -- as mentioned above, if the magazine case 100 is inserted in the chassis unit 1, as shown in drawing 39 (A) - (B), the tray lock discharge pawl 4 will go into the discharge pawl guide 138, and will press the tray lock link 137 from back. Then, since the tray lock link 137 resists the energization force of torsion coiled spring 137a and is rotated counterclockwise, the engagement to the right rear edge of a tray 110 separates, and a lock is canceled.

[0163] \*\* Since the engagement of the small rack 611 of a loading plate 610 to the loading gear 310 separates when the loading completion extrusion member 630 arrives at the last edge, a loading plate 610 suspends slide migration and a loading arm 620 remains in a loading completion location.

[0164] 2-2. the drive of a shift-after disk selection actuation \*\* plate -- as mentioned above, if the post-shift plate 320 carries out slide migration leftward, the rack 321 for an up-and-down shift will engage with the loading gear 310 rotated counterclockwise. Then, since the post-shift plate 320 carries out slide migration leftward further, the up-and-down guide pin 351 of the posterior part of the up-and-down chassis 350 is energized up by the posterior part stair-like cam 322 of one articles shown in drawing 18 and drawing 19 .

[0165] \*\* Since the back end of the link plate 330 connected with the drive coincidence of a left shift plate at the left end of the post-shift plate 320 is energized leftward, the link plate 330 rotates counterclockwise. The left shift plate 340 connected with the front end of the link plate 330 is energized ahead, and carries out slide migration. Therefore, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is energized up by the left part stair-like cam 341 of the left shift plate 340 shown in drawing 20 and drawing 21 . In addition, according to migration to the front of the left shift plate 340, left contact pawl 424a of the swing chassis 420 separates from the slit 342 for a lock.

[0166] \*\* a rise of an up-and-down chassis and a halt -- as mentioned above, since the up-and-down

guide pin 351 is energized up, the up-and-down chassis 350 goes up gradually from the location of the tray 110 of the bottom. And if detected by the photosensor which it does not illustrate that the up-and-down chassis 350 came to the location corresponding to the desired tray 110 (here a top to the 3rd step of tray 110), a stop signal will be sent to the loading motor 311, and the loading gear 311 will stop. Therefore, the post-shift plate 320 and the up-and-down chassis 350 stop.

[0167] 2-3. In the initial state of the magazine lock discharge actuation \*\* initial-state drive unit 360, as shown in drawing 26 (A), pin 366a of the tray slide link 366 is in the narrow diameter portion of top tray slide cam-groove 364a in the 1st cam gear 364. Therefore, the trace rider 367 is rotated counterclockwise and grasping section 367b at the tip of the trace rider 367 has an include angle which separates from the 1st tray support pawl 111 of a tray 110. In addition, since pin 367a of the trace rider 367 is in the induction of bottom tray slide cam-groove 364b at this time, the trace rider 367 has been ahead extended according to the energization force of an extension spring 369.

[0168] \*\* the rise of a drive unit -- from the above initial states, if disk selection actuation by rise of the up-and-down chassis 350 is performed as mentioned above, the drive unit 360 will go up with a rise of the up-and-down chassis 350. Then, the tray support pawl 111 of the tray 110 of the stage beyond it counters grasping section 367b of the trace rider 367 further with the 1st support pawl 111 of the desired tray 110 (suppose that the 3rd step of tray 110 was chosen from the top in this example).

[0169] \*\* Start migration of a tray, next a drive motor 361, and rotate the 1st cam gear 364 clockwise. That is, if a drive motor 361 operates, rotation of a shaft will be transmitted to C gear 362c from A gear 362a, and C gear 362c will rotate clockwise. Rotation of C gear 362c is transmitted to E gear 362e through D gear 362d, and E gear 362e rotates it clockwise. Since E gear 362e is engaging with continuation rack section 363b of the Maine rack 363 as shown in drawing 25, the Maine rack 363 carries out slide migration leftward by rotation of the clockwise rotation of E gear 362a. Then, F gear 362f which is engaging with intermittent rack section 363a rotates clockwise. Since rotation of F gear 362f is transmitted to the 1st cam gear 364 through -I gear 362i, the 1st cam gear 364 rotates clockwise. [0170] As mentioned above, since pin 366a of the tray slide link 366 will go into the major diameter of top tray slide cam-groove 364a as shown in drawing 26 (B) if the 1st cam gear 364 rotates clockwise, the tray slide link 366 rotates clockwise. Then, grasping section 367b of the trace rider 367 engages with the 1st tray support pawl 111 of the tray 110 of three sheets which counters this. If the cam gear 365 furthermore rotates clockwise, pin 367a of the trace rider 367 will go into the pars intermedia of a bottom tray slide cam groove. Then, since the energization force of an extension spring 369 is resisted and the trace rider 367 moves back as shown in drawing 26 (C), as shown in drawing 40, each tray 110 moves back by grasping section 367b which engaged with the 1st tray support pawl 111. Thus, if a tray 110 moves, as shown in drawing 41 (A) and (B), 110d of lobes formed in the tray 110 will go into slit 212a of the tray guide 212 corresponding to this.

[0171] \*\* if the tray 110 of three sheets of the discharge upper case of a lock moves -- the 1- of the perimeter -- the 3rd tray support pawl 111-113 is shown in drawing 6 (B) -- as -- the 1- go into the slits 122a-124a of the 3rd top slit section 122-124. this time -- the 1- of the maximum upper case -- the 3rd tray support pawl 111-113 -- the 1- the 3rd top slit section 122-124 and the 1- since it moves to the 1st - 3rd top slit section 122-124 side, the member which regulates a gap of the vertical direction of both the slit section of a top and the bottom disappears from the boundary part of the maximum upper case with the 3rd bottom slit section 132a-134a. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the condition that the lock was canceled.

[0172] In addition, a tray 110 is energized by the initial valve position by the bottom trace pulling 139 by the side of the magazine inferior-surface-of-tongue section 130, and is energized by the bottom trace pulling 125 by the side of the magazine top-face section 120 in the disengageable location. Therefore, even when a magazine is divided, location regulation of a tray 110 is possible and the fluctuation and elutriation by vibration are prevented.

[0173] \*\* a halt of a tray gear -- since the cam gear 364 will rotate clockwise further and pin 366a of the tray slide link 366 will go into the narrow diameter portion of top tray slide cam-groove 364a as shown in drawing 26 (D) if a tray 110 carries out specified quantity migration as mentioned above, the tray

slide link 366 rotates counterclockwise. Then, grasping section 367b of the trace rider 367 separates from the 1st tray support pawl 111. On the other hand, pin 367a of the trace rider 367 goes into the radii section of bottom tray slide cam-groove 364b. Then, the trace rider 367 moves ahead according to the energization force of an extension spring 369.

[0174] In addition, as shown in drawing 28 (A) - (D), the 2nd cam gear 365 is also rotated with the 1st cam gear 364 in process of migration of the tray 110 by the above trace riders 367, but since pin 368a of the disk catch lever base 368 is in the narrow diameter portion of disk catch cam-groove 365a, the disk catch lever base 368 is not changed.

[0175] 2-4. a rise of a magazine division actuation \*\* magazine electrode holder -- start the magazine shift motor 221 and rotate a cylindrical cam 220, after canceling the lock condition of the magazine case 100 as mentioned above. Then, if it is formed in the perimeter of a cylindrical cam 220 as shown in drawing 10, the electrode-holder guide pin 211 of Hidari of the magazine electrode holder 210 will be energized up by plug-like cam 220a. Disc-like gear 220c of a cylindrical cam 220 makes coincidence rotate the 2nd disk section 232 through the 1st disk section 231, as shown in drawing 8. Since the rack 241 for a magazine shift of the magazine shift plate 240 is engaging with circular gear 232b of the 2nd disk section 232, the magazine shift plate 240 carries out slide migration with rotation of the 2nd disk section 232 in back. Therefore, as shown in drawing 12, the electrode-holder guide pin 211 on the right of the magazine electrode holder 210 is energized up by the inclination cam die 242 formed in the magazine shift plate 240.

[0176] Thus, if the electrode-holder guide pin 211 is energized up, as shown in drawing 14, the magazine electrode holder 210 will go up even to a magazine open position (the highest location), the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch which is not illustrated, and the magazine shift motor 221 will stop.

[0177] \*\* If the link plate 330 rotates counterclockwise in the case of the rise of the above-mentioned up-and-down chassis 350 which is discharge of a floating lock, the post-floating lock pawl 332 will separate from post-lock slit 14a of the post-floating lock plate 14. Moreover, if the left shift plate 340 carries out slide migration ahead, the left floating lock pawl 343 will separate from left lock slit 12a of the left floating lock plate 12. Furthermore, since the lock pawl 243 will separate from right lock slit 13a as shown in drawing 15 and drawing 16 if the magazine shift plate 240 moves back in the case of a rise of the above-mentioned magazine electrode holder 210, after mentioning above, a floating lock is completely canceled with discharge of the lock to the floating lock pawl 332 and the left floating lock pawl 343, and the chassis unit 1 has become floating by absorber 11 support before division of a magazine.

[0178] \*\* division of a magazine -- as a rise of the above magazine electrode holders 210 shows to drawing 10 and drawing 12, although the magazine top-face section 120 grasped by bottom grasping pawl 210b is raised with the tray 110 of three sheets, since the magazine inferior-surface-of-tongue section 130 is grasped by bottom grasping pawl 2a of the chassis unit 1, it remains caudad with the tray 110 of two sheets. Therefore, the magazine case 100 will be divided up and down in the interior of the chassis unit 1.

[0179] Since the guide shaft 3 inserts in insertion hole 210a of the magazine electrode holder 210 and is further inserted in the guide hole 126 of the magazine top-face section 120 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated. And as the tray 110 of three sheets lifted with the magazine top-face section 120 is shown in drawing 41 (A) and (B), 110d of the lobe is contained in slit 212a of the tray guide 212. therefore, the support around each tray 110 -- the 1- if it totals with the support for the 3rd tray support pawl 111-113, four points will be supported and it will not hang down in the specific direction

[0180] 2-5. Start the drive motor 361 of the drive unit 360 again after the completion of division of the migration magazine case 100 of a swing unit transfer actuation \*\* power plate, and make the slide migration of the Maine rack 363 carry out leftward. Then, since front contact cylinder 414b of the 1st gear lock link 414 separates from upheaval marginal 363c of the Maine rack 363 and goes into 363d of cave-in edges as shown in drawing 31 (b), the 1st gear lock link 414 is counterclockwise rotated



focusing on rotation shaft 414a. And since back contact cylinder 414c of the 1st gear lock link 414 moves ahead, the 2nd gear lock link 415 has regulation by back contact cylinder 414c solved, and will be in a rotatable condition focusing on rotation shaft 415a.

[0181] Since lock cylinder 415b of the 2nd lock link 415 is in contact with the left-hand side edge of the upheaval marginal 412b, while slide migration of the power rack 412 is regulated by it, the power plate 411 is also having migration regulated by it on the other hand, although the power rack 412 is energized leftward by bay 413a on the right-hand side of the spring member 413 as shown in drawing 31 (A) before a transfer drive. Therefore, since it is shown by the stopper 354 to spite and left contact pawl 424a is pressed down with the left shift plate 340, the swing chassis 420 is locked so that it may not rotate to hard flow with an external impact etc.

[0182] And since the 2nd gear lock link 415 will rotate counterclockwise, lock cylinder 415b will separate from the left-hand side edge of upheaval marginal 412b and it will move to first transition according to the energization force of the power rack 412 as shown in drawing 31 (B) if the 2nd gear lock link 415 will be in a rotatable condition as mentioned above, regulation by lock cylinder 415b is canceled. Then, the power rack 412 carries out slide migration leftward, and the rack section 412a engages with J gear 362j.

[0183] Since the J gear j is engaging with C gear 362c, it is counterclockwise rotated by rotation of the clockwise rotation of C gear 362c. Therefore, as shown in drawing 32 (C), the power rack 412 carries out slide migration leftward further by the J gear j. Moreover, since the power rack 412 and the power plate 411 are connected by the spring member 413, they carry out slide migration also of the power plate 411 leftward with the slide migration to the left of the power rack 412.

[0184] \*\* If the rotation power plate 411 of a swing chassis carries out slide migration leftward, once the connection pin 422 of the swing chassis 420 moves back along with guide hole 411a of the power plate 411, it will move ahead. Therefore, the swing chassis 420 starts rotation counterclockwise centering on the transfer rotation shaft 421. In addition, this rotation is guided when the connection pin 422 and a guide pin 423 move along the transfer rotation guide hole 352,353.

[0185] Thus, if the swing chassis 420 continues rotation, as shown in drawing 42 (A), the swing unit 400 whole will be transferred between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided. And as shown in drawing 42 (B), right contact pawl 424b of the point of the swing chassis 420 engages with the V character slit 6 of the chassis unit 1, and rotation of the swing chassis 420 stops it.

[0186] \*\* Since rack section 412a will separate from J gear 362j as shown in drawing 32 (D) if the power rack 412 continues slide migration leftward by the halt J gear j of a power plate, the power rack 412 stops and the power plate 411 also stops. In coincidence, it separates from lock cylinder 415b of the 2nd gear lock link 415 from the first transition of upheaval marginal 412b of the power rack 412.

[0187] On the other hand, if the Maine rack 363 continues slide migration leftward, since front contact cylinder 414b of the 1st gear lock link 414 will contact upheaval marginal 363c from 363d of cave-in edges of the Maine rack 363, the 1st gear lock link 414 is clockwise rotated focusing on rotation shaft 414a. Then, since back contact cylinder 414c of the 1st gear lock link 414 moves back, the 2nd gear lock link 415 is back energized by back contact cylinder 414c.

[0188] According to the energization force of this back contact cylinder 414c, it rotates clockwise, and the 2nd gear lock link 415 will be in the condition that migration of the power rack 412 was locked, when that lock cylinder 415b contacts the right-hand side edge of upheaval marginal 412b. In addition, since, as for F gear 362f and intermittent rack section 363a of the Maine rack 363, the intermittent sections face, power does not get across to henceforth [ F gear 362f ] in the meantime.

[0189] 2-6. disk chucking actuation -- if the swing unit 400 is transferred as mentioned above, as shown in drawing 34 (B), the turntable 520 of a drive unit 500 will come to the location corresponding to the main hole Of Disk D. In this condition, the delivery motor 543 is driven and the optical pickup 530 is moved to a turntable 520 side. And if the switch knob 532 of the optical pickup 530 moves to inner circumference further after being pressed with the switch spring 533, the release plate 511 will be pressed by the edge of the optical pickup 530. Then, release edge 511a of the release plate 511 presses



the inclination side face of the lower part of a sleeve 522. Since the pressed sleeve 522 resists the energization force of a spring 523 and moves caudad, the energization to the disk hook 525 is canceled. In addition, it is possible to perform motion control of the optical pickup 530 for this release plate 511 migration by controlling the delivery motor 543 using a timer.

[0190] And if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position), the location of the magazine shift plate 240 at this time will be detected by the chucking switch which is not illustrated, and the magazine shift motor 221 will stop.

[0191] Thus, if the magazine electrode holder 210 descends to the mid-position, the magazine top-face section 120 held at this will also descend. Then, as shown in drawing 34 (C), the disk D held at the 3rd step of tray 110 in the magazine top-face section 120 is pushed against a turntable 520, and the disk insertion section 524 inserts in the main hole of Disk D. Since the disk hook 525 prepared in the disk insertion section 524 at this time is released from the energization force of a spring 523 as mentioned above, it rotates inside focusing on supporting-point 525b, and mooring section 525a inserts it in the main hole of Disk D.

[0192] And after this mooring section 525a bends down to pass under a main hole, the optical pickup 530 is moved and the press to the release plate 511 is solved. Then, since release edge 511a of the release plate 511 separates from the inclination side face of the lower part of a sleeve 522, a sleeve 522 moves up according to the energization force of a spring 523, and the energization to the disk hook 525 recovers it. Therefore, the disk hook 525 rotates outside according to the energization force of a spring 523, and since mooring section 525a engages with the upper limit of the main hole of Disk D, Disk D is held on a turntable 520. Moreover, at this time, as shown in drawing 29 (E), only the 3rd step of disk catch link 117 of a tray 110 in the magazine top-face section 120 stands face to face against press pawl 370b of the disk catch lever 370.

[0193] 2-7. After rotation disk chucking completion of a disk release actuation \*\* disk catch lever, since pin 368a of the disk catch lever base 368 will go into a major diameter from the narrow diameter portion of disk catch cam-groove 365a as shown in drawing 29 (E), (F), and drawing 30 (J) if the 2nd cam gear 365 rotates clockwise with a drive motor 361, the disk catch lever base 368 rotates clockwise.

[0194] In addition, although the 1st cam gear 364 is also rotated with the 2nd cam gear 365 at this time, as shown in drawing 27 (E) - (H), since the pins 366a and 367a of the tray slide link 366 and the trace rider 367 are in the narrow diameter portion and the radii section of a top and the bottom tray slide cam grooves 364a and 364b, the tray slide link 366 and the trace rider 367 are not changed.

[0195] \*\* If release of a disk, thus the disk catch lever base 368 rotate clockwise, as shown in drawing 29 (F), press pawl 370b of the disk catch lever 370 will move leftward, and will press character section 117a of KO of the 3rd step of disk catch link 117 of a tray 110. then, the 1- by which the disk catch link 117 rotated counterclockwise and was connected with the both ends -- since the 3rd disk catch link 114-116 rotates (refer to drawing 37 ), each disk attaching part 114a-116a releases the periphery of the disk D by which chucking was carried out on the turntable 520.

[0196] 2-8. magazine evacuation actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) after Disk D is released as mentioned above, the location of this magazine shift plate 240 will be detected by the magazine opening switch which is not illustrated, and the magazine shift motor 221 will stop.

[0197] If the magazine electrode holder 210 goes up to the highest location again, the magazine top-face section 120 held at this will also go up. Therefore, it leaves the disk D of one sheet by which chucking was carried out on the turntable 520, the tray 110 of three sheets in the magazine top-face section 120 is lifted, and path clearance required for playback of Disk D is secured.

[0198] Since press pawl 370b is contained in character section 117a of KO at this time as shown in drawing 30 (K), the disk catch lever 370 once rotates up with the migration to the upper part of a tray 110. Then, if the 2nd cam gear 365 rotates further clockwise with a drive motor 361, as shown in drawing 29 (H) and drawing 30 (L), the disk catch lever base 368 resists the energization force of compression coil spring 368b, slide migration will be carried out and the disk catch lever 370 and the disk catch lever base 368 will serve as the same horizontal plane in the upper part. After termination of

the 2nd cam gear 365 of operation, the magazine shift motor 221 is started, the magazine shift plate 240 is moved back, and left contact pawl 424a of the swing chassis 420 is locked.

[0199] 2-9. disk playback actuation -- as mentioned above, rotate the disk D on a turntable 520 by starting a spindle motor 521 after making the drive base 510 into floating. And the delivery motor 543 is started, a feed screw 542 is rotated, and read of the information on Disk D and playback are performed by moving the optical pickup 530 along with a guide rail 541.

[0200] Since the chassis unit 1 is in floating supported only by the absorber 11 as mentioned above, the vibration from the outside is absorbed by the absorber 11, the member of a turntable 520 and optical pickup 530 grade is not influenced by vibration, but the exact read of it becomes possible.

[0201] 2-10. Explain the activity which contains again the disk D which ended disk re-receipt actuation playback on the tray 110 in the magazine case 100.

[0202] After suspending rotation of the disk re-grasping actuation turntable 520, a drive motor 361 is started. Counterclockwise the 2nd cam gear 365 \*\* Drawing 29 (G), Rotate to the location shown in drawing 30 (K), and the magazine shift motor 221 is started after that. If the magazine electrode holder 210 is dropped to a disk chucking location (mid-position), it will be detected by the chucking switch which the location of the magazine shift plate 240 at this time does not illustrate, and the magazine shift motor 221 will stop. Thus, if the magazine electrode holder 210 descends to the mid-position again, the 3rd step of tray 110 in the magazine top-face section 120 will touch the disk D on a turntable 520.

[0203] And if a drive motor 361 is started and the 2nd cam gear 365 is counterclockwise rotated, as shown in drawing 29 (G) - (E), since pin 368a of the disk catch lever base 368 will go into the narrow diameter portion of disk catch cam-groove 365a of the 2nd cam gear 365, the disk catch lever base 368 rotates counterclockwise. Thereby, press pawl 370b of the disk catch lever 370 moves to the method of the right, and separates from character section 117a of KO of the disk catch link 117 in the 3rd step of tray 110.

[0204] Then, while the 3rd disk catch 116 rotates according to the energization force of the catch spring 118 in the direction in which the disk attaching part 116a contacts the edge of Disk D, the disk catch link 117 rotates and the 1st and 2nd disk catches 114,115 rotate in the direction in which the disk attaching parts 114a and 115a contact the edge of Disk D (refer to drawing 36 ). Therefore, the perimeter of the disk D by which chucking was carried out on the turntable 520 is again held in the 3rd step of tray 110.

[0205] In addition, at this time, as shown in drawing 27 (G) - (E), the 1st cam gear 364 is also rotated with the 2nd cam gear 365, but since the pins 366a and 367a of the tray slide link 366 and the trace rider 367 are in the narrow diameter portion and the radii section of a top and the bottom tray slide cam grooves 364a and 364b, the tray slide link 366 and the trace rider 367 are not changed.

[0206] \*\* In the condition of the disk chucking discharge actuation above, like the time of disk chucking, move the optical pickup 530 to inner circumference, and cancel the energization force of a spring 523 over the disk hook 525. And if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location), it will be detected by the magazine opening switch which the location of the magazine shift plate 240 at this time does not illustrate, and the magazine shift motor 221 will stop.

[0207] Thus, if the magazine electrode holder 210 goes up to the highest location, the magazine top-face section 120 held at this will also go up. Therefore, the main hole escapes from the disk hook 525 and the disk insertion section 524, and the disk D held by the tray support pawl 111 of the 3rd step of tray 110 goes up with the magazine top-face section 120. Since the engagement force of the disk hook 525 over the main hole of Disk D has become weaker by discharge of the energization force of a spring 523 as mentioned above, desorption of Disk D can be performed smoothly.

[0208] 2-11. swing unit start actuation -- if the drive motor 361 of the drive unit 360 is started and C gear 362c is counterclockwise rotated after canceling chucking Of Disk D as mentioned above, the Maine rack 363 will carry out slide migration rightward. Then, since front contact cylinder 414b of the 1st gear lock link 414 separates from upheaval marginal 363c of the Maine rack 363 and contacts 363d of cave-in edges as shown in drawing 32 (C), the 1st gear lock link 414 is counterclockwise rotated focusing on rotation shaft 414a. And since back contact cylinder 414c of the 1st gear lock link 414

moves ahead, the 2nd gear lock link 415 has regulation by back contact cylinder 414c solved, and will be in a rotatable condition focusing on rotation shaft 415a.

[0209] Since the power rack 412 is energized rightward by the bay on the left-hand side of the spring member 413 at this time as shown in drawing 32 (D), this energization force has joined lock cylinder 415b of the 2nd lock link 415. Therefore, it rotates counterclockwise, and lock cylinder 415b moves ahead and the 2nd gear lock link 415 contacts the first transition of upheaval marginal 412b. Then, the power rack 412 with which regulation by lock cylinder 415b was solved carries out slide migration rightward, and the rack section 412a engages with J gear 362j.

[0210] Since the J gear j is engaging with C gear 362c, it is clockwise rotated by rotation of the counterclockwise rotation of C gear 362c. Therefore, the power rack 412 carries out slide migration rightward further by the J gear j. Since the power rack 412 and the power plate 411 are connected by the spring member 413, they carry out slide migration also of the power plate 411 rightward with the slide migration to the right of the power rack 412.

[0211] If the power plate 411 carries out slide migration rightward, the connection pin 422 of the swing chassis 420 will move back along with guide hole 411a of the power plate 411. Therefore, the swing chassis 420 starts rotation clockwise centering on the transfer rotation shaft 421. In addition, this rotation is guided when the connection pin 422 and a guide pin 423 move along the transfer rotation guide hole 352,353.

[0212] Thus, if the swing chassis 420 continues rotation, as shown in drawing 22, the swing unit 400 whole will be shaken out from between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided, and will return to the initial valve position of the method of the left rear of the chassis unit 1. At this time, the after [ the swing chassis 424 ] left end section contacts a stopper 354.

[0213] 2-12. descent of a magazine coalesce actuation \*\* magazine electrode holder -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped even to a magazine insertion discharge location (the minimum location) after the swing unit 400 is shaken out as mentioned above, it will be detected by the magazine closing switch which the location of the magazine shift plate 240 at this time does not illustrate, and the magazine shift motor 221 will stop. In addition, the lock pawl 243 engages with right lock slit 13a by migration of the magazine shift plate 240 at this time.

[0214] Thus, as shown in drawing 9, the magazine top-face section 120 grasped by the descending magazine electrode holder 210 descends with the tray 110 of three sheets, and coalesces in the magazine inferior-surface-of-tongue section 130 which remained caudad with the tray of two sheets. Since the guide shaft 3 has inserted in insertion hole 210a of the magazine electrode holder 210 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated, and it coalesces correctly.

[0215] \*\* If magazine lock actuation and the 1st cam gear 365 rotate counterclockwise further, as shown in drawing 26 (D) - (B), pin 367a of the trace rider 367 will go into induction through the pars intermedia of bottom tray slide cam-groove 364b. Then, since the trace rider 367 moves ahead, each tray 110 moves ahead by grasping section 367b which engaged with the 1st tray support pawl 111. Thus, if a tray 110 moves, it will separate from 110d of lobes formed in the tray 110 from slit 212a of the tray guide 212 corresponding to this.

[0216] Furthermore, since pin 366a of the tray slide link 366 will go into the narrow diameter portion of top tray slide cam-groove 364a as shown in drawing 26 (A) if the cam gear 365 rotates counterclockwise, the tray slide link 366 rotates counterclockwise. Then, grasping section 367b of the trace rider 367 separates from the 1st tray support pawl 111 of the tray 110 of three sheets which counters this.

[0217] if the tray 110 of three sheets of an upper case moves -- the 1- of the perimeter -- the 3rd tray support pawl 111-113 is shown in drawing 6 (A) -- as -- the 1- it goes into the slits 132a-134a of the 3rd bottom slit section 132-134. this time -- the 1- of the maximum upper case -- the 3rd tray support pawl 111-113 -- the 1- the 3rd top slit section 122-124 and the 1- since it comes to the location over the boundary part of the maximum upper case with the 3rd bottom slit section 132a-134a, a gap of the

vertical direction of both the slit section of a top and the bottom is regulated. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the lock condition which cannot be divided.

[0218] 2-13. up-and-down chassis downward actuation -- as mentioned above, start the loading motor 311 and rotate the loading gear 310 clockwise, after completing coalesce and the lock of the magazine case 100. Then, since the post-shift plate 320 carries out slide migration rightward, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the posterior part stair-like cam 322.

[0219] The link plate 330 connected with the left end of the post-shift plate 320 at coincidence rotates clockwise, and the left shift plate 340 connected with the front end of the link plate 330 carries out slide migration in back. Therefore, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the left part stair-like cam 341 of the left shift plate 340.

[0220] As mentioned above, since the up-and-down guide pin 351 is energized caudad, the up-and-down chassis 350 descends and it returns to the early minimum location. Moreover, as mentioned above, if the link plate 330 rotates clockwise, the post-floating lock pawl 332 will engage with post-lock slit 14a of the post-floating lock plate 14. And if the left shift plate 340 carries out slide migration in back, the left floating lock pawl 343 will engage with left lock slit 12a of the left floating lock plate 12. Therefore, the chassis unit 1 will be in an early floating lock condition with the lock to the lock pawl 243 of the magazine shift plate 240 mentioned above.

[0221] 2-14. If the post-shift plate 320 carries out slide migration rightward as mentioned above, the back end of the Power Lok link 640 will be energized rightward by the magazine ejection actuation pan. Then, the Power Lok link 614 rotates clockwise and the Power Lok guide 615 is energized leftward with a guide pin 641. Then, since a loading plate 610 moves leftward and the small rack 611 engages with the loading gear 310, a loading plate 610 carries out slide migration leftward further. And since the heights 622 of a loading arm 620 move to horizontal level 612a of the clipping section 612 of a loading plate 610, a loading arm 620 rotates clockwise and moves the extrusion member 630 ahead.

[0222] On the other hand, the magazine lock 650 has the guide pin 653 in the location on the right of the left end section of the lock guide hole 323 at the time of insertion of the magazine case 100. And if the post-shift plate 320 carries out slide migration rightward as mentioned above, since a guide pin 653 will move to the left end section of the lock guide hole 323, the magazine lock 650 rotates slightly clockwise and the lock projection 652 moves it to the left from the front end of 131d of locked slots.

[0223] Therefore, as shown in drawing 17, while the back end of the extrusion member 630 extrudes the magazine case 100 ahead, 131d of locked slots formed in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 to the lock projection 652 separates. And if specified quantity discharge of the magazine case 100 is carried out from the magazine insertion opening 2, since a loading arm 620 will press the ejection and the switch which the chassis unit 1 does not illustrate, the loading motor 311 stops and a loading arm 620 remains in the completion location of discharge.

[0224] Thus, if the magazine case 100 moves in the direction discharged from the chassis unit 1, as shown in drawing 39 (C) - (A), the tray lock discharge pawl 4 will separate from the discharge pawl guide 138, and will separate from the tray lock link 137. Then, since the tray lock link 137 is clockwise rotated according to the energization force of torsion coiled spring 137a, the edge of the tray lock link 137 engages with the right rear edge of each tray 110. And the bottom trace pulling 125 and the bottom trace pulling 139 are in contact with stop projection 112a of each tray 110. Therefore, the migration is regulated and, as for the tray 110, the lock condition is held. In this condition, a user pulls out the magazine case 100 from the magazine insertion opening 2.

[0225] Furthermore, the ejection activity of the disk D in the magazine case 100 is as follows. That is, as shown in drawing 7 (B) and drawing 37, by moving control unit 136c with a finger, the slide migration of the disk locking lever 136 is made to carry out rightward, and the rotation lock of the 1st disk catch 114 and the 2nd disk catch 115 is canceled. And if the disk lever 135 is pushed in with a finger and rotated back, since the edge of Disk D will be pressed and Disk D will be discharged, a finger holds and

draws out Disk D using the slitting 110a, 121a, and 131a of the magazine case 100.

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[Translation done.]

**\* NOTICES \***

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2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

**[Drawing 1]** It is the top view showing the gestalt of operation of the disk unit of this invention.

**[Drawing 2]** It is the side elevation showing the gestalt of operation of the disk magazine of this invention.

**[Drawing 3]** It is the top view showing the tray in the disk magazine of the gestalt of operation of drawing 2 .

**[Drawing 4]** It is the top view showing the magazine top-face section in the gestalt of operation of drawing 2 .

**[Drawing 5]** It is the top view showing the magazine inferior-surface-of-tongue section in the gestalt of operation of drawing 2 .

**[Drawing 6]** It is the expanded sectional view of the top slit section in the disk magazine of the gestalt of operation of drawing 2 , and the bottom slit section, and in (A), a coalesce lock condition and (B) show a coalesce lock discharge condition, and (C) shows a division condition.

**[Drawing 7]** It is a disk locking lever in the magazine inferior-surface-of-tongue section of drawing 5 , and the expansion top view of a tray lock link, and (A) shows the De Dis clock status and (B) shows a disk lock discharge condition.

**[Drawing 8]** It is the top view showing the magazine shift unit in the gestalt of operation of drawing 1 .

**[Drawing 9]** It is the front view showing the time of magazine insertion of the magazine shift unit of drawing 8 .

**[Drawing 10]** It is the front view showing the time of magazine division of the magazine shift unit of drawing 8 .

**[Drawing 11]** It is the right side view showing the time of magazine insertion of the magazine shift unit of drawing 8 .

**[Drawing 12]** It is the right side view showing the time of magazine division of the magazine shift unit of drawing 8 .

**[Drawing 13]** It is the left side view showing the time of magazine insertion of the magazine shift unit of drawing 8 .

**[Drawing 14]** It is the left side view showing the time of magazine division of the magazine shift unit of drawing 8 .

**[Drawing 15]** It is the top view showing the rack for a magazine shift in the magazine shift unit of drawing 8 .

**[Drawing 16]** It is the top view showing the floating lock discharge condition of the rack for a magazine shift of drawing 15 .

**[Drawing 17]** It is the top view showing the magazine drawing-in condition or discharge condition of a magazine ejection unit in the gestalt of operation of drawing 1 .

**[Drawing 18]** It is the rear view showing the time of the up-and-down chassis in the gestalt of operation of drawing 1 being in the minimum location.

**[Drawing 19]** It is the rear view showing the time of the up-and-down chassis in the gestalt of operation

of drawing 1 being in the mid-position.

[Drawing 20] It is the left side view showing the time of the up-and-down chassis in the gestalt of operation of drawing 1 being in the minimum location.

[Drawing 21] It is the left side view showing the time of the up-and-down chassis in the gestalt of operation of drawing 1 being in the mid-position.

[Drawing 22] It is the top view of the drive unit in the gestalt of operation of drawing 1 , and a swing unit.

[Drawing 23] It is the top view showing the circumference of the drive motor in the drive unit of drawing 22 .

[Drawing 24] It is the top view showing the gear group for driving the 1st and 2nd cam gears in the drive unit of drawing 22 .

[Drawing 25] It is the side elevation showing the engagement condition of the Maine rack in the drive unit of drawing 22 , E gear, and F gear.

[Drawing 26] It is top view (A) - (D) which shows the drive procedure of the trace rider at the time of the tray migration in the drive unit of drawing 22 .

[Drawing 27] It is top view (E) - (F) which shows the condition of the trace rider at the time of the disk release in the drive unit of drawing 22 .

[Drawing 28] It is top view (A) - (D) which shows the condition of the disk catch lever at the time of the tray migration in the drive unit of drawing 22 .

[Drawing 29] It is top view (E) - (F) which shows the drive procedure of the disk catch lever at the time of the disk release in the drive unit of drawing 22 .

[Drawing 30] It is top view (I) - (L) which shows the variation rate of the disk catch lever at the time of the tray rise after disk chucking in the drive unit of drawing 22 .

[Drawing 31] It is the top view of the transfer drive in the gestalt of operation of drawing 1 , and (A) is in the lock condition of a power plate, and (B) is in the lock discharge condition of a power plate.

[Drawing 32] It is the top view of the transfer drive in the gestalt of operation of drawing 1 , and (C) is in the transfer initiation condition of a swing unit, and (D) is in the completion condition of transfer of a swing unit.

[Drawing 33] It is the top view of the drive unit in the gestalt of operation of drawing 1 , and an inner circumference detection condition and (C of the playback condition according [ (A) ] to optical pickup and (B)) are in a disk chucking discharge condition.

[Drawing 34] It is drawing of longitudinal section of the turntable in the drive unit of drawing 33 , and, for (A), a disk approach condition and (C of disk the condition of not equipping, and (B)) are in a disk wearing condition.

[Drawing 35] It is the top view showing link structure with the post-shift plate in the magazine ejection unit of drawing 17 .

[Drawing 36] It is the top view showing disk the condition of not inserting in the disk magazine of the gestalt of operation of drawing 2 .

[Drawing 37] It is the top view showing the disk insertion and the ejection condition in the disk magazine of the gestalt of operation of drawing 2 .

[Drawing 38] It is the top view showing the disk drawing-in completion condition in the magazine ejection unit of drawing 17 .

[Drawing 39] It is the expansion top view of the tray lock link in the magazine inferior-surface-of-tongue section of drawing 5 , and in (A), a tray lock condition and (B) show a tray lock link rotation initiation condition, and (C) shows a tray lock discharge condition.

[Drawing 40] It is the side elevation showing the migration condition of the tray in the gestalt of operation of drawing 1 .

[Drawing 41] It is the side elevation (A) and top view (B) showing the tray insertion condition to the slit of the tray guide in the gestalt of operation of drawing 1 .

[Drawing 42] It is the top view (A) and right side view (B) showing the transfer condition of the swing unit of drawing 22 .

## [Description of Notations]

D -- Disk

1 -- Chassis unit

1a -- Right-hand side electrode-holder guide slot

2 -- Magazine insertion opening

2a -- Bottom grasping pawl

2b, 210c -- Return section

2c -- Left-hand side electrode-holder guide slot

3 -- Guide shaft

4 -- Tray lock discharge pawl

6--V character slit

10 -- Case unit

11 -- Damper

12 -- Left floating lock plate

12a -- Left lock slit

12b -- Left side plate

13 -- Right floating lock plate

13a -- Right lock slit

13b -- Right side plate

14 -- After floating lock plate

14a -- Back lock slit

15 -- Damper spring

100 -- Magazine case

110 -- Tray

110a, 121a, 131a -- Slitting

110b -- Notch

110c -- Disk guide

110d -- Lobe

111 -- 1st tray support pawl

112 -- 2nd tray support pawl

112a -- Stop projection

113 -- 3rd tray support pawl

114 -- 1st disk catch

114a, 115a, 116a -- Disk attaching part

114b -- Pressed pawl

115 -- 2nd disk catch

116 -- 3rd disk catch

117 -- Disk catch link

117a -- The character section of KO

117b -- Regulation slot

118 -- Catch spring

120 -- Magazine top-face section

121 -- Top-face plate

121b -- Heights

122 -- The 1st top slit section

123 -- The 2nd top slit section

124 -- The 3rd top slit section

122a-124a, 132a-134a, 212a -- Slit

125 -- Bottom trace pulling

126 -- Guide hole

127,130a -- Side attachment wall



130 -- Magazine inferior-surface-of-tongue section  
131 -- Inferior-surface-of-tongue plate  
131b -- Crevice  
131c -- Hollow  
131d -- Locked slot  
132 -- The 1st bottom slit section  
133 -- The 2nd bottom slit section  
134 -- The 3rd bottom slit section  
135 -- Disk discharge lever  
135a, 136e, 137a, 642 -- Torsion coiled spring  
136 -- Disk locking lever  
136a -- Plate section  
136b -- Press section  
136c -- Control unit  
136d -- Slide hole  
137 -- Tray lock link  
138 -- Discharge pawl guide  
139 -- Bottom trace pulling  
200 -- Magazine shift unit  
210 -- Magazine electrode holder  
210a -- Insertion hole  
210b -- Bottom grasping pawl  
211 -- Electrode-holder guide pin  
212 -- Tray guide  
213 -- Cloth plate  
220 -- Cylindrical cam  
220a -- Spiral cam  
220b -- Ohira gearing  
220c -- Disc-like gear  
221 -- Magazine shift motor  
221a -- Transfer gear  
230 -- Synchro gear  
231 -- The 1st disk section  
231a, 231b, 232a, 232b -- Circular gear  
232 -- The 2nd disk section  
240 -- Magazine shift plate  
241 -- Rack for a magazine shift  
242 -- Inclination cam die  
243 -- Right floating lock pawl  
244 -- Hole for a lock  
300 -- Up-and-down unit  
310 -- Loading gear  
311 -- Loading motor  
311a, 362, 371 -- Transfer gear group  
312 -- Shift cam gear  
320 -- Back shift plate  
321 -- Rack for an up-and-down shift  
322 -- Posterior part stair-like cam  
323 -- Lock guide hole  
330 -- Link plate  
331 -- Top-most-vertices section

332 -- After floating lock pawl  
340 -- Left shift plate  
341 -- Left part stair-like cam  
342 -- Slit for a lock  
343 -- Left floating lock pawl  
350 -- Up-and-down chassis  
351 -- Up-and-down guide pin  
352,353 -- Transfer rotation guide hole  
354 -- Stopper  
360 -- Drive unit  
361 -- Drive motor  
362a - 362 j--A gear - J gear  
363 -- Main rack  
363a -- Intermittent rack section  
363b -- Continuation rack section  
363c, 412b -- Upheaval edge  
363d -- Cave-in edge  
364 -- 1st cam gear  
364a -- Top tray slide cam groove (a narrow diameter portion, major diameter)  
364b -- Bottom tray slide cam groove (induction, pars intermedia, radii section)  
365 -- 2nd cam gear  
365a -- Disk catch cam groove (a narrow diameter portion, major diameter)  
366 -- Tray slide link  
366a, 367a, 368a -- Pin  
367 -- Trace rider  
367b -- Grasping section  
368 -- Disk catch lever base  
368b -- Compression coil spring  
369,512,614,640 -- Extension spring  
370 -- Disk catch lever  
370a -- Torsion coiled spring  
370b -- Press pawl  
400 -- Swing unit  
410 -- Transfer drive  
411 -- Power plate  
411a -- Guide hole  
412 -- Power rack  
412a -- Rack section  
412c -- Specification part  
413 -- Spring member  
413a -- Bay  
414 -- 1st gear lock link  
414a, 415a -- Rotation shaft  
414b -- Front contact cylinder  
414c -- Back contact cylinder  
415 -- 2nd gear lock link  
415b -- Lock cylinder  
420 -- Swing chassis  
421 -- Transfer rotation shaft  
422 -- Connection pin  
423,641,644,653 -- Guide pin

424a -- Left contact pawl  
424b -- Right contact pawl  
500 -- Drive unit  
510 -- Release device  
511 -- Release plate  
511a -- Release edge  
520 -- Turntable  
521 -- Spindle motor  
522 -- Sleeve  
522a -- Pin center, large stopper  
523 -- Spring  
524 -- Disk insertion section  
525 -- Disk hook  
525a -- Mooring section  
525b -- Supporting point  
530 -- Optical pickup  
531 -- Lens  
532 -- Switch knob  
533 -- Switch spring  
540 -- Delivery device  
541 -- Guide rail  
542 -- Feed screw  
543 -- Delivery motor  
600 -- Magazine ejection unit  
610 -- Loading plate  
611 -- Smallness rack  
612 -- Clipping section  
612a -- Horizontal level  
612b -- Ramp  
613,623 -- Hook  
615 -- Power Lok guide  
620 -- Loading arm  
622 -- Heights  
630 -- Extrusion member  
631 -- Catch section  
640 -- Power Lok link  
643,651 -- Rotation shaft  
650 -- Magazine lock  
652 -- Lock projection

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[Translation done.]

**\* NOTICES \***

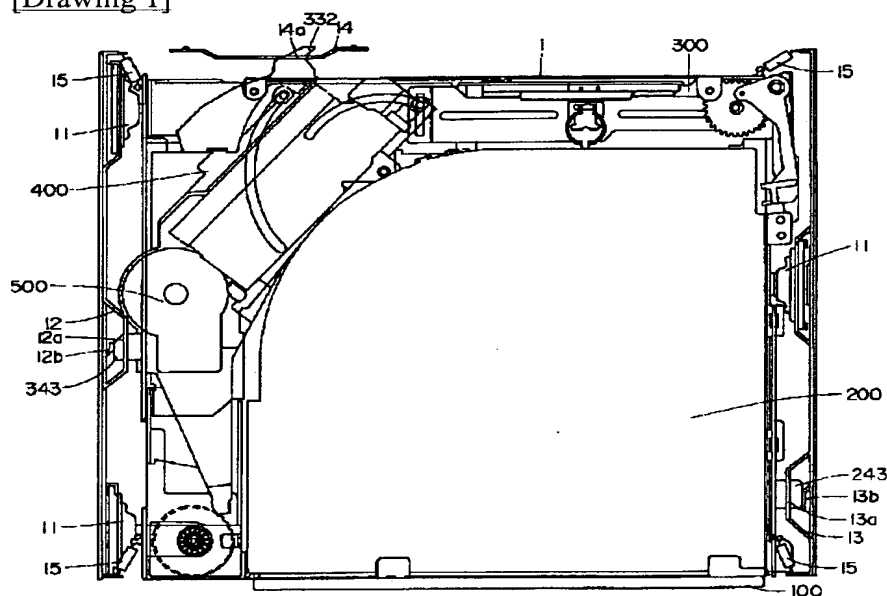
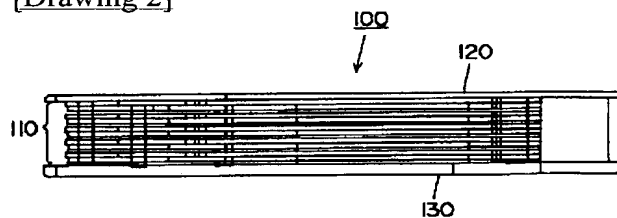
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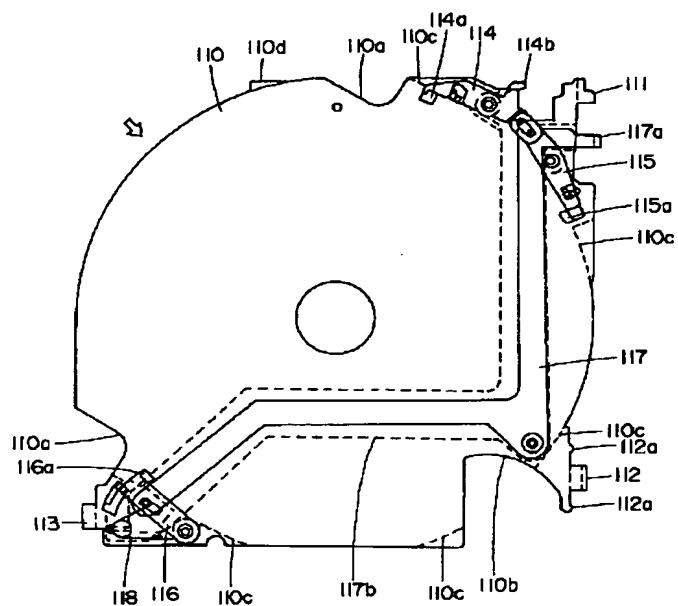
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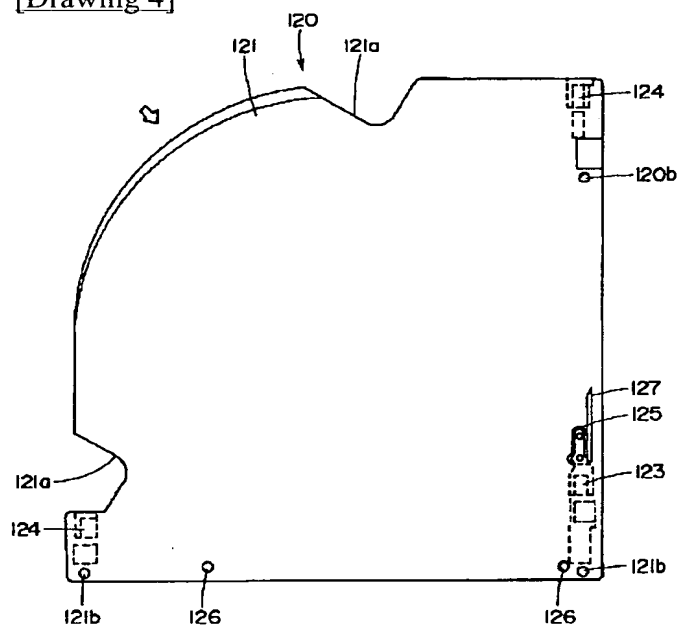
**DRAWINGS**

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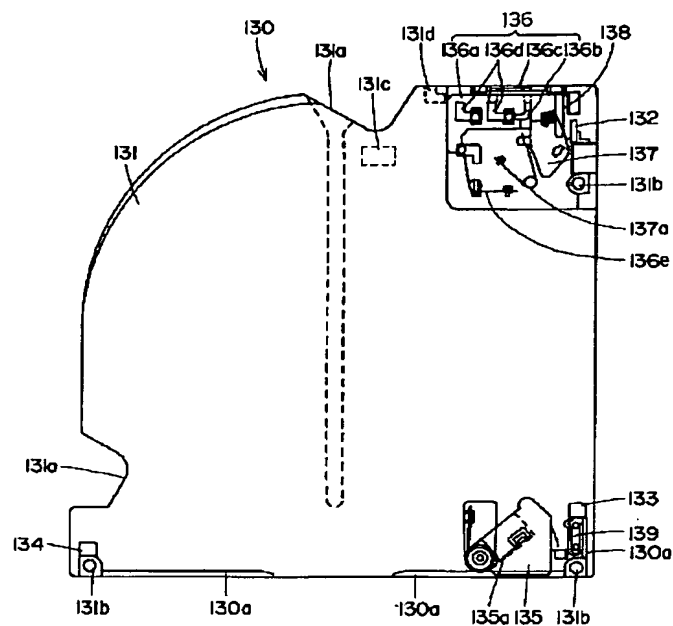
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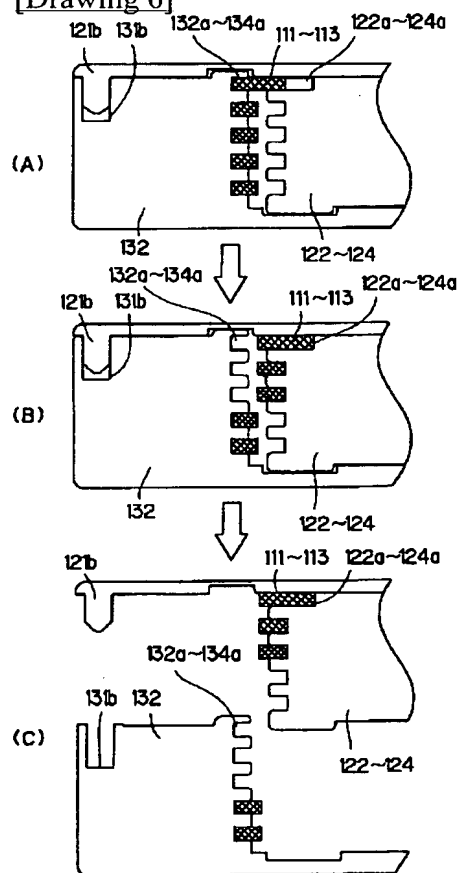
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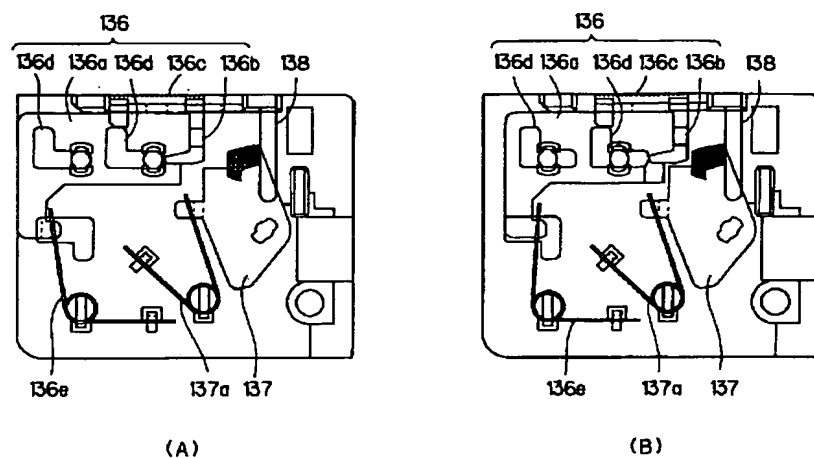
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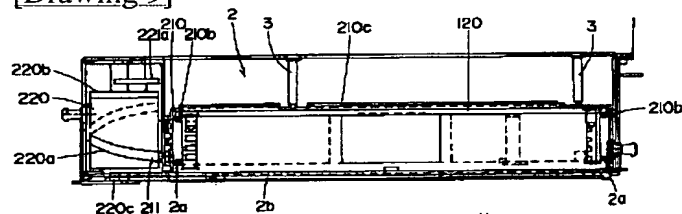
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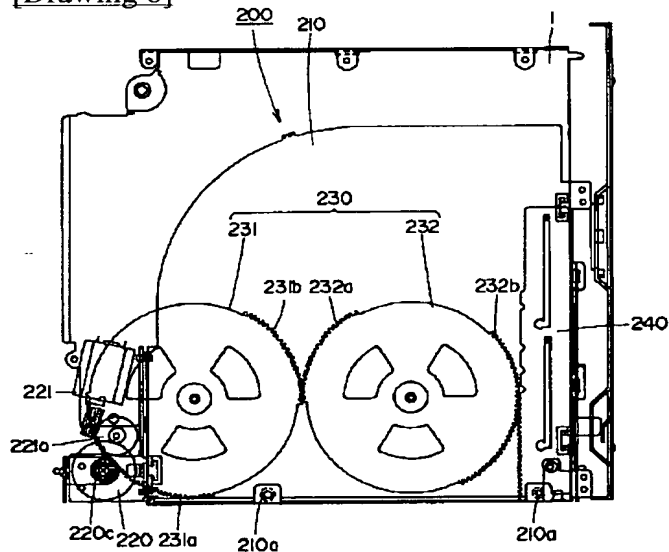
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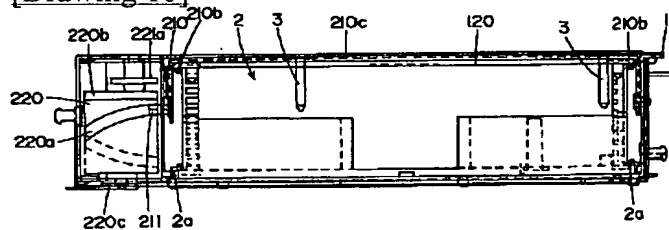
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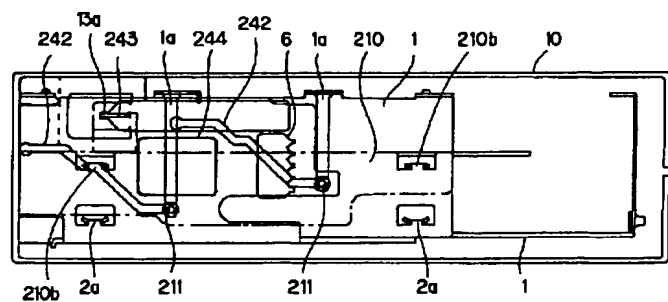
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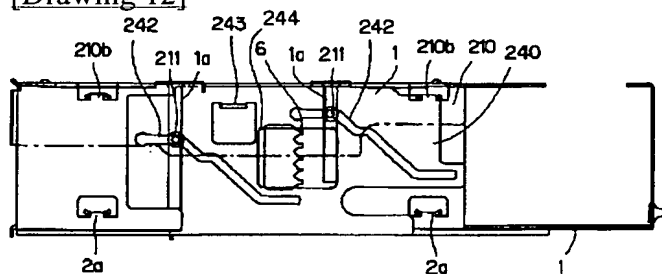
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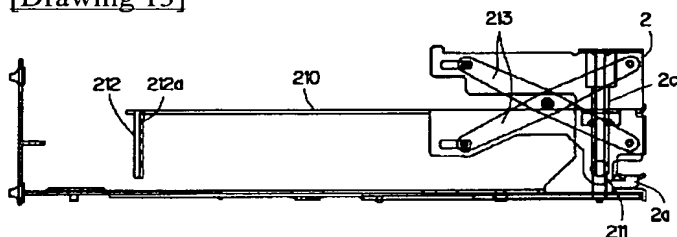
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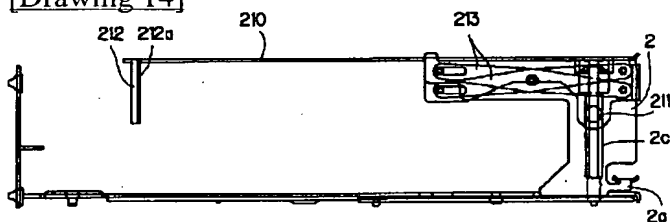
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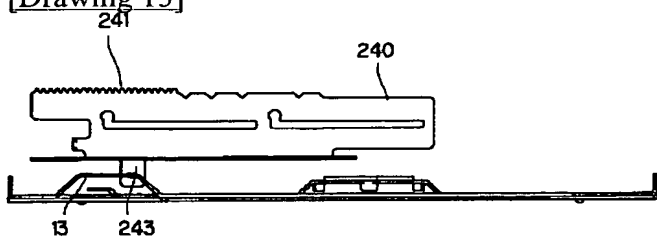
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[Drawing 14]

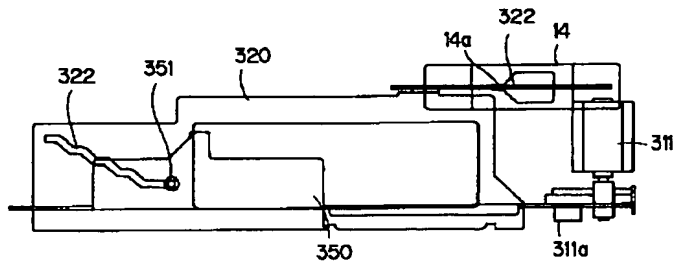


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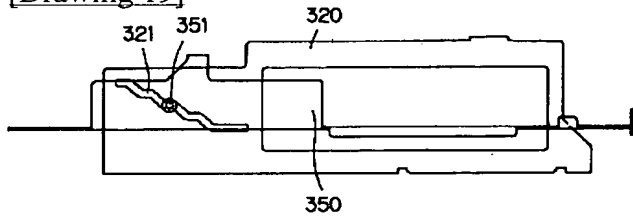


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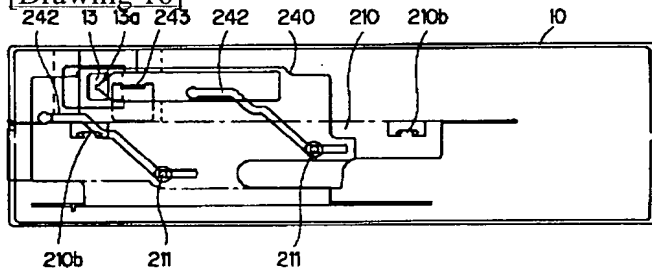




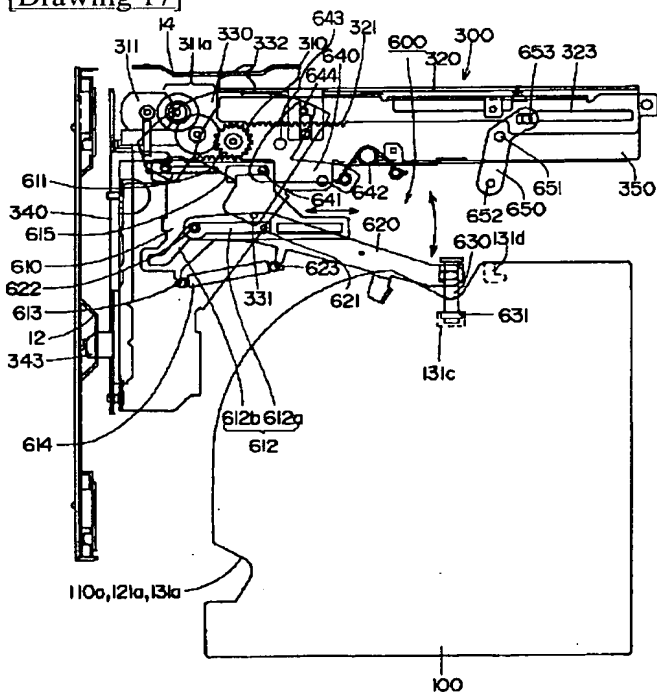
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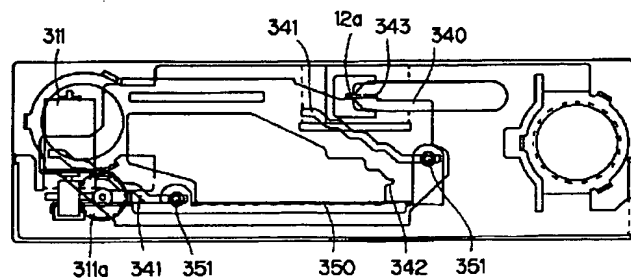
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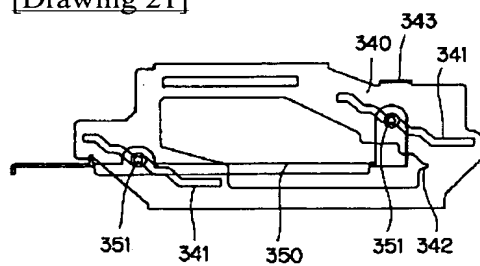
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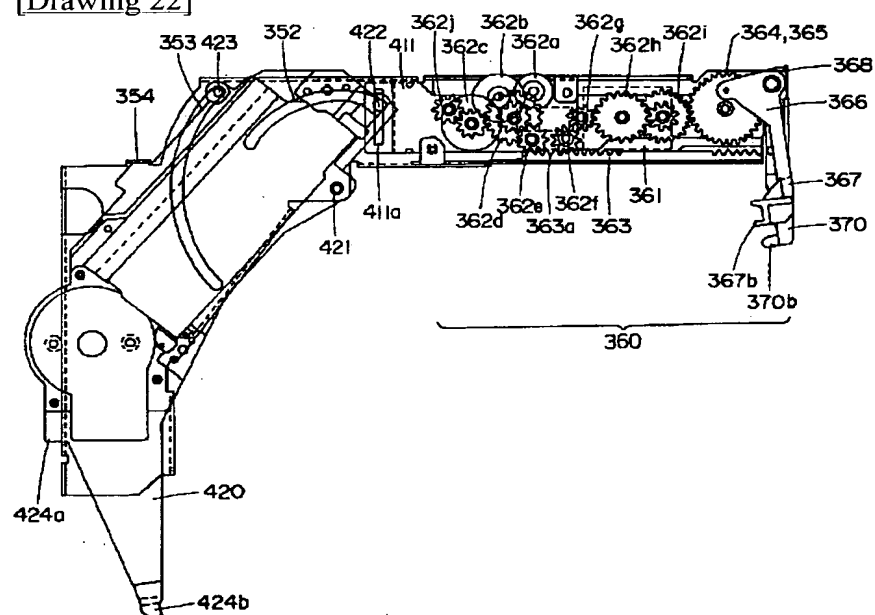
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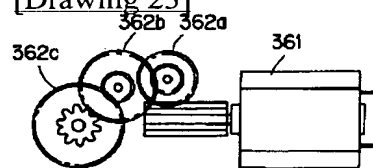
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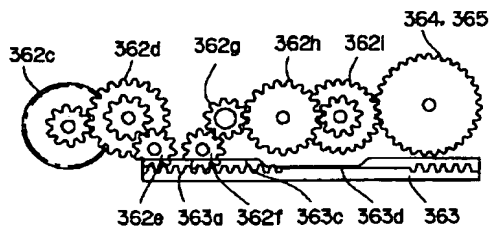
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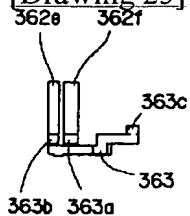
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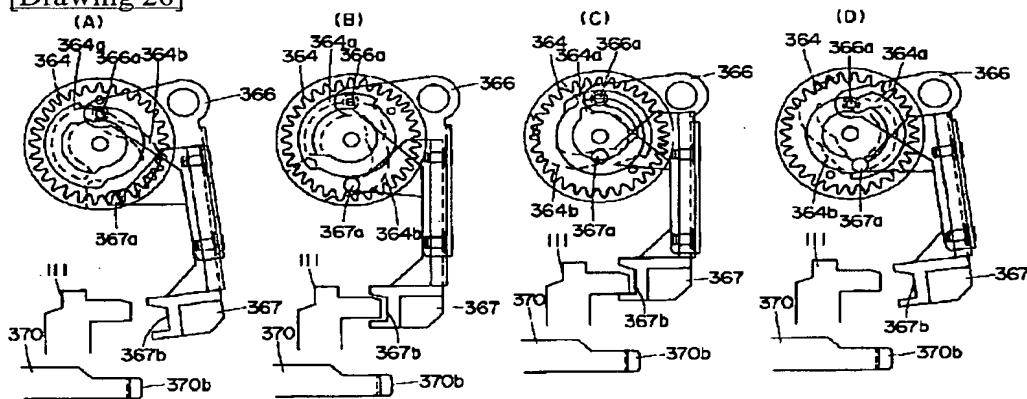
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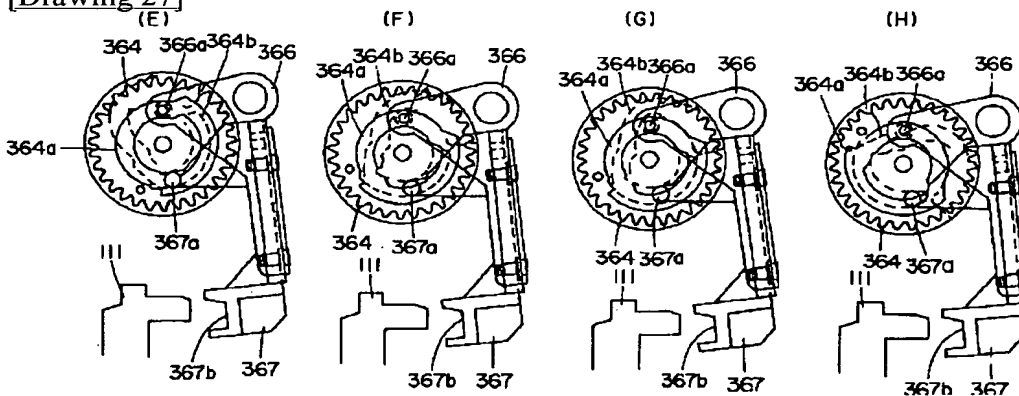
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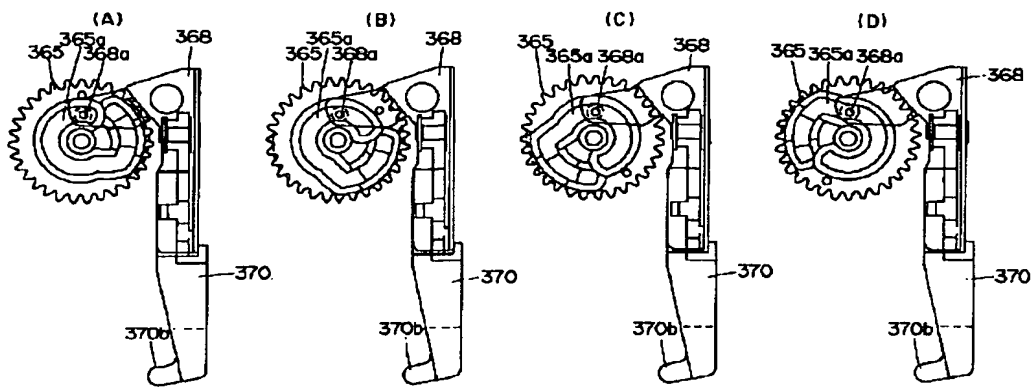
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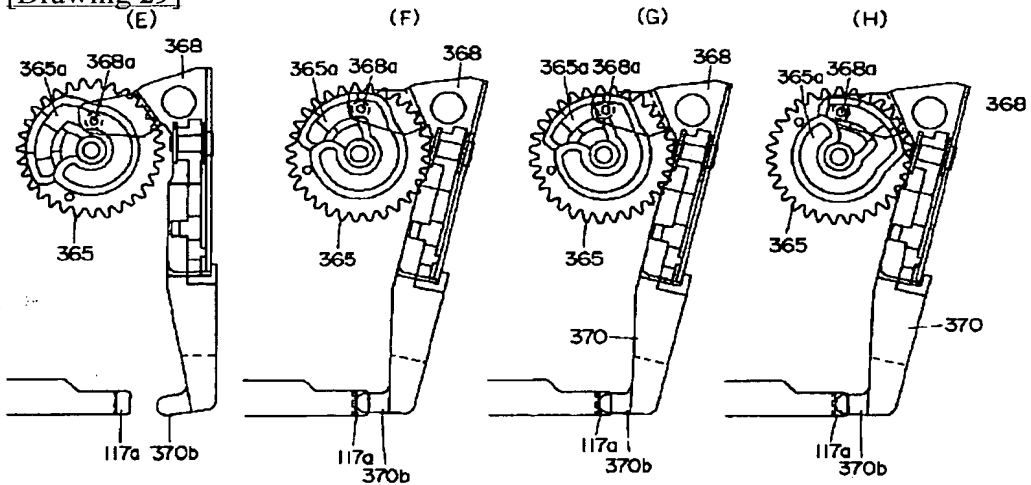
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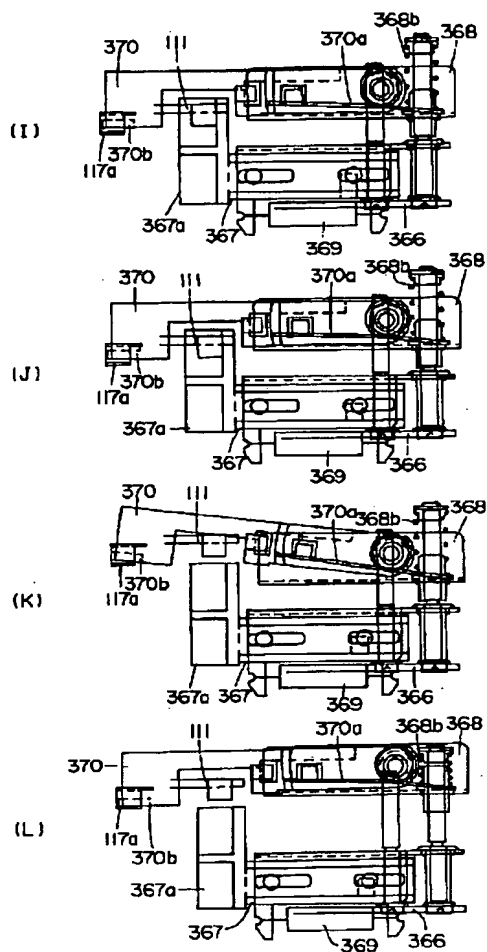
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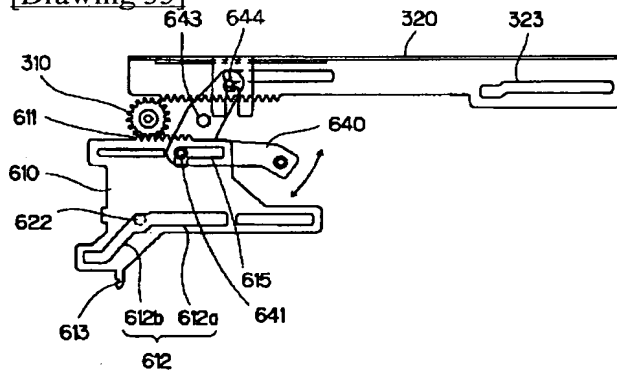
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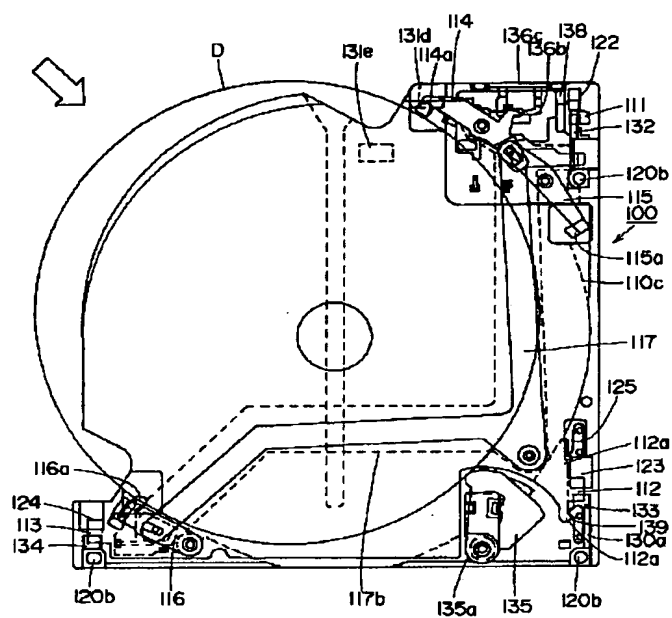
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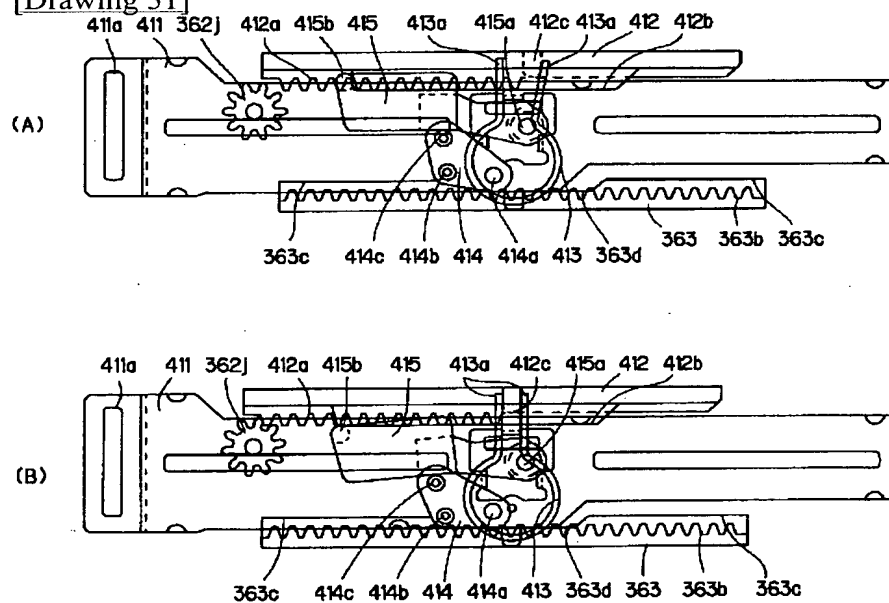
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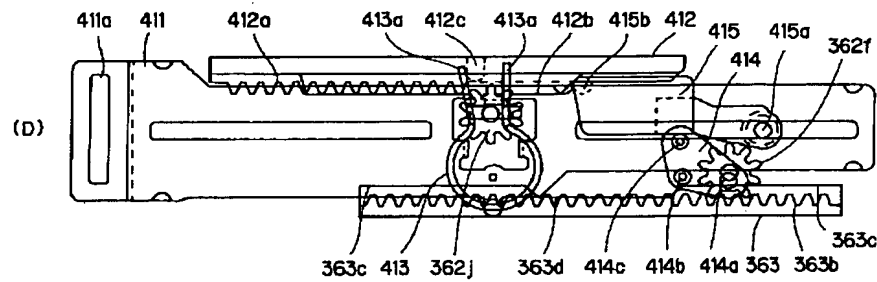
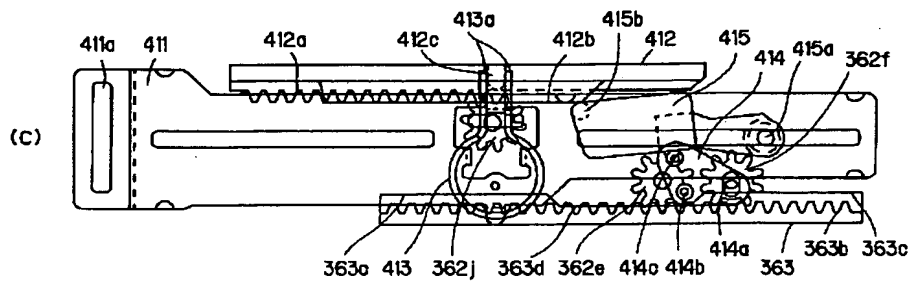
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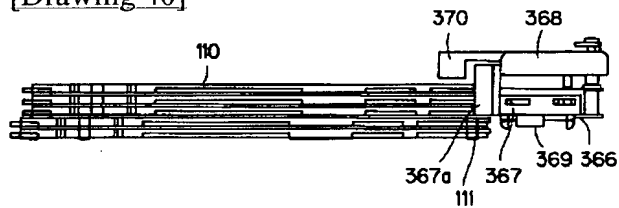
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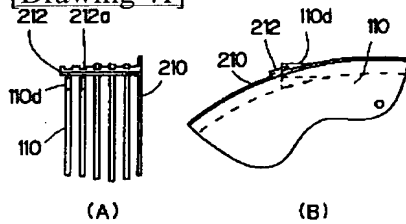
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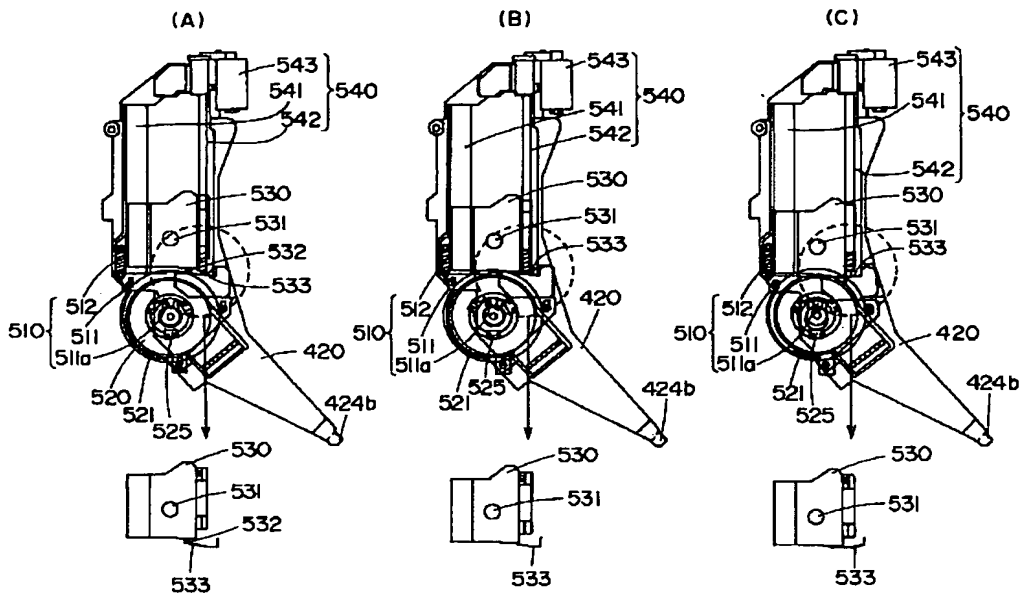
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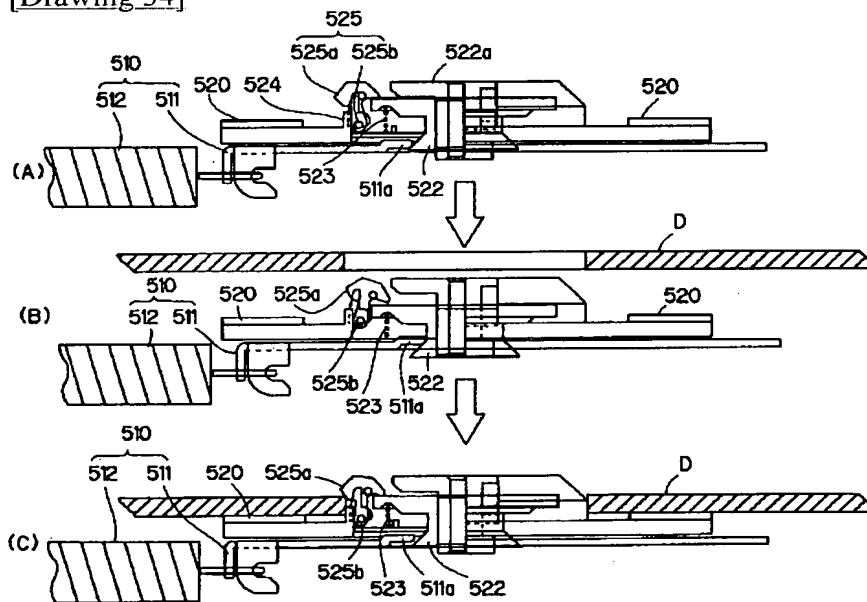
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[Drawing 33]

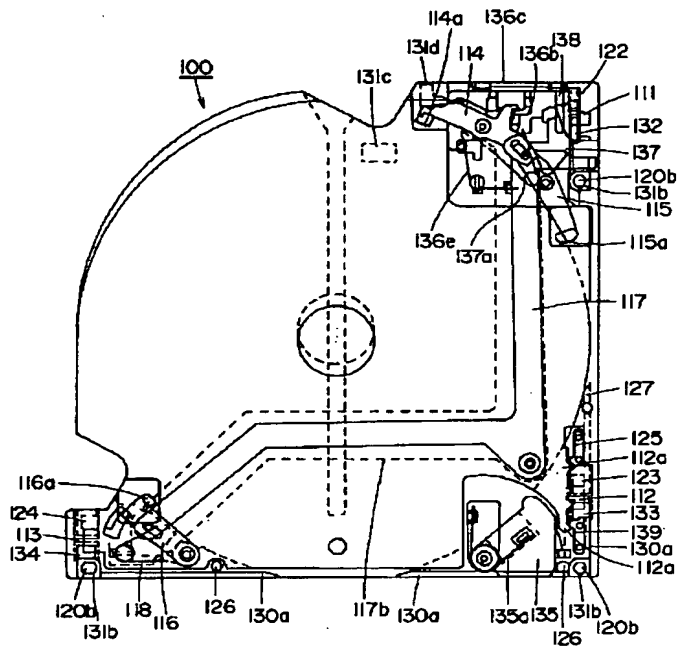


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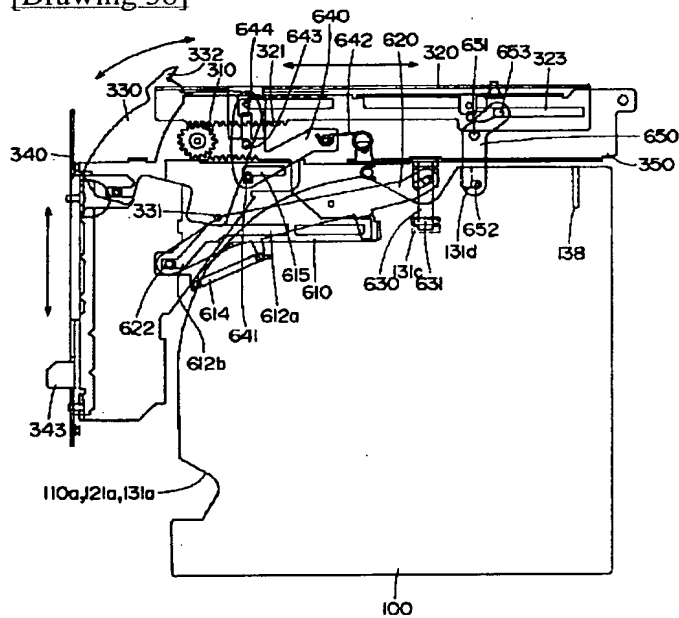


[Drawing 36]

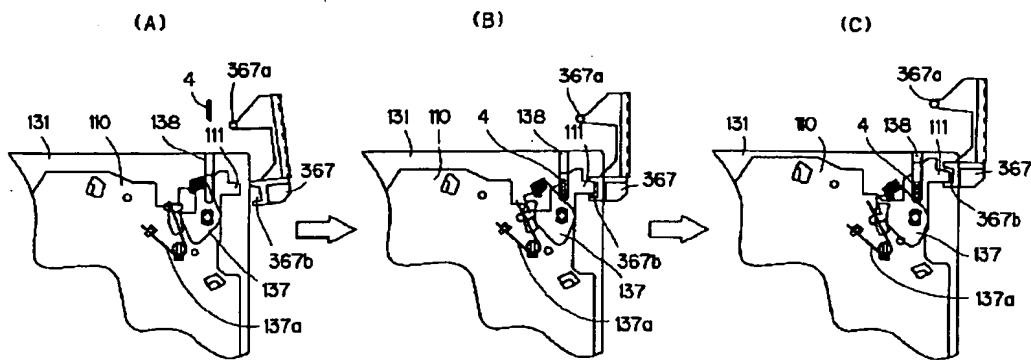




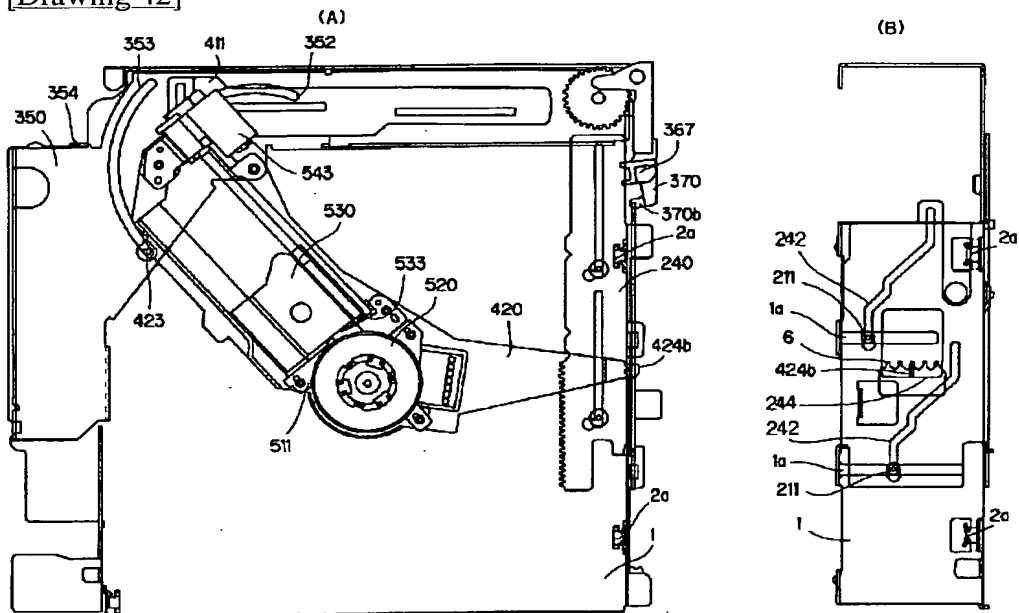
[Drawing 38]



[Drawing 39]



[Drawing 42]



[Translation done.]